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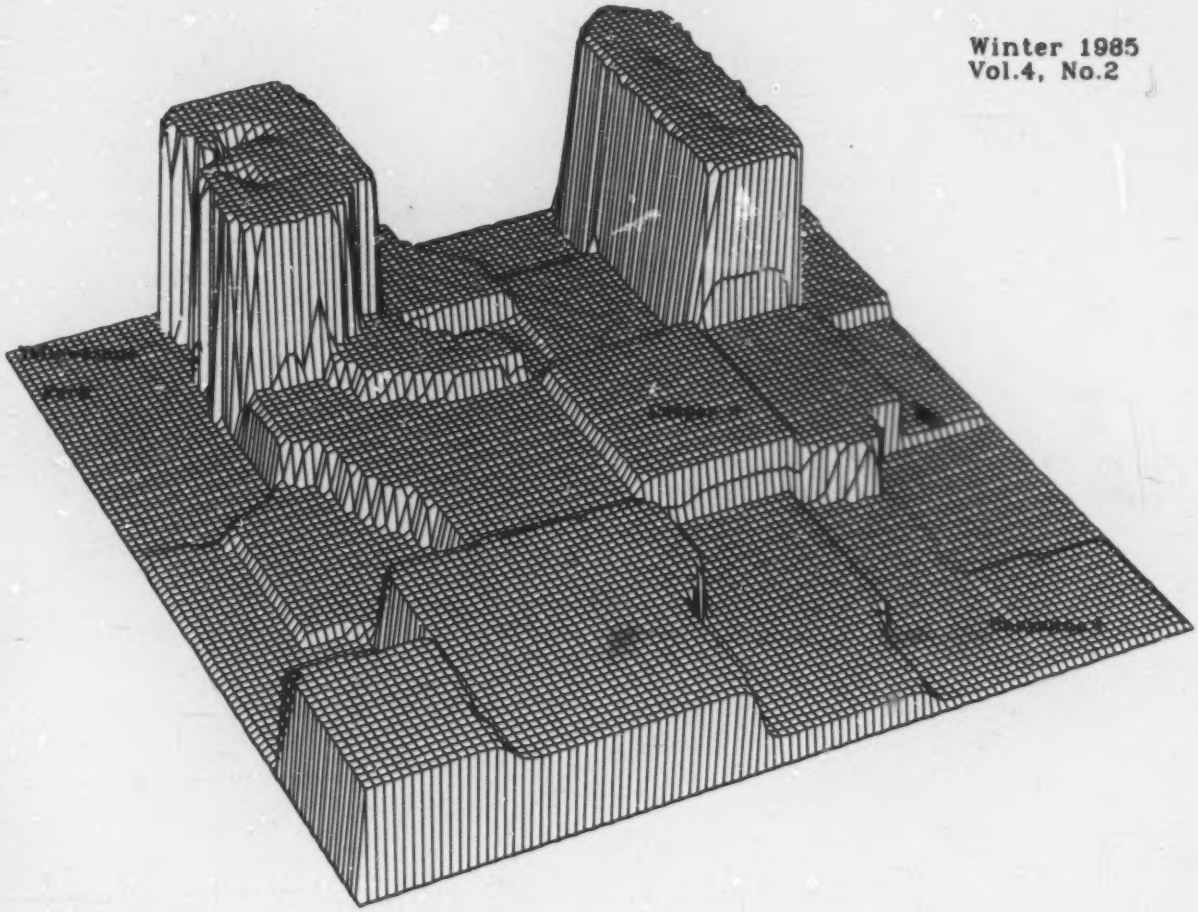
WYOMING QUARTERLY UPDATE

Winter 1985
Vol.4, No.2



IPR

1983 Taxable Oil Production By County

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing cheerful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which does not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

Efforts to expand the subject and geographic detail (county data) of data sets will be made continuously. Featured for the third time in this edition is an industry profile. In this edition, a discussion of the oil industry is presented.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a contour map depicting taxable oil production by county for 1983.

First-time readers of WQU should refer to the "format" explanations on page 48 for keys on how best to use and interpret data presented in this publication.

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OTHER IPR SERVICES AND RESEARCH REPORTS ARE LISTED ON PAGE 49 OF THIS WQU.

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UNIVERSITY OF WYOMING

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Wyoming Quarterly Update is published four times per year in fall, winter, spring, and summer editions.

The articles appearing in this publication represent the opinions of the authors and do not necessarily reflect the views of the state of Wyoming or the University of Wyoming or their respective executive officers. Duplication or quotation of material in this publication is welcomed, but it is requested that WQU, the Institute of Policy Research, University of Wyoming, be credited.

WYOMING SCENE

Overview and Perspective

While signs of slowing continued throughout the fall and into the fourth quarter, there were also signs that the national economy remained generally healthy and that it might begin picking up at least a portion of its former momentum during the first quarter of 1985. Nor was the slowing viewed by most economists as a harbinger of another national recession.

The $3.7-trillion U.S. economy slowed in terms of real growth to just 1.9 percent during the third quarter, down from the 7.1 percent registered during the second quarter. Many indicators continued to show signs of softening through October, including real gross national product, industrial production, retail sales, housing starts, and orders for durable goods. The federal government's index of leading economic indicators fell 0.7 percent in October, with seven of the 10 indicators reporting negative monthly results.

Hardgoods manufacturing also continued to be soft in October. New orders fell 4.1 percent, to $94.8 billion, following a 3.3 percent decline in September. The October level for hardgoods manufacturing was no higher than the level attained in October of 1983, after reaching an all-time high of $105.3 billion in March of 1984. Some of the softening was attributed to strikes in the U.S. and Canada, and in a drop-off of Department of Defense orders.

Orders for transportation equipment fell 1.3 percent in October, to $21.8 billion, after an 11.9 percent drop in September. The same held true for orders of capital equipment. In October, orders for capital equipment fell 11 percent, to $24.8 billion. Some of the softness in capital equipment orders may have stemmed from concerns in the business community about the cooler economy and uncertainties over possible changes in the federal tax laws. With respect to transportation equipment, it appeared Detroit was geared-up for a rebound. First quarter production plans were at their highest levels in six years.

The signs of cooling were tempered by other positive signs. For the week ending November 24, Business Week magazine's production index showed weekly output gains in electric power, crude oil refining, paper, paperboard, lumber, and rail freight, while production of steel, autos, and trucks showed declines. Sharp drops were also registered in number of business failures and initial unemployment claims.

Capital goods orders had jumped 26 percent during the first year of the recovery, its strongest annual showing since 1958. Through the first six months of 1984, orders were still running at the same 26 percent annualized rate.

Strong orders for machine tools were another positive sign during October. October orders were slightly lower than the September figures, but were still running 40 percent above year-earlier figures, according to the National Machine Tool Builders Association. The backlog of orders was at its highest level in more than two years.

The National Association of Purchasing Management's composite index, which monitors the seasonally adjusted movements of orders, production, employment, delivery times, and inventories, rose to 52.1 percent in November, up from 50.8 percent in October and 43.6 percent in September. When more than 50 percent of the firms reporting in the survey show rising trends, the index presumably points to an expanding economy.

Stronger money growth also seemed to be having some beneficial effects. November car sales, for instance, were higher than October levels, and sales of new homes extended their gains. In addition, it appeared there may be some additional impetus for lower interest rates.

While initial unemployment claims rose in

October, such claims fell in November. In November, such new claims averaged about 390,000 per week, down from about 405,000 per week in October.

The job situation outlook remained generally optimistic. The Conference Board's index of help wanted advertising increased seven points to 136 in October. In addition, a national survey by Manpower Inc. showed that hiring plans in the first quarter of 1985 almost equaled the strong showing of the first quarter of 1984. Also, according to the survey, the number of companies planning to cut staff matched the lowest number in the nine-year history of the survey.

Early-season Christmas shoppers also helped push retail sales up 1.8 percent in November, the sharpest such gain in seven months. The Commerce Department reported that retail sales, after adjustments for seasonal variations, rose to a record $110.3 billion in November. Clothing stores and all-purpose department stores both recorded large increases. In recent months, retail sales had been a source of concern. Sales dropped 1.7 percent in July and 0.8 percent in August, with the declines only partly offset by a 1.5 percent increase in September. In October, retail sales rose only 0.1 percent. Since much of the cooling of the economy in recent months had been attributed to weakened consumer sales, the news was greeted with considerable pleasure by Reagan Administration economists.

The situation with respect to inflation, however, was somewhat less cheerful. In November, beef prices climbed at their steepest rate in five years, forcing overall wholesale prices up one-half percentage points in the biggest wholesale inflation increase since January 1984. The inflation rise was also spurred by increases in heating oil, gasoline, and cars.

The rise in the Labor Department's Producer Price Index marked the first wholesale price rise since July and established the increase for the first 11 months of 1984 at an annual rate of 1.9 percent. This was more than three times 1983's 0.6 percent increase, but still well below the inflation rates of over 10 percent registered as recently as 1979 and 1980.

In Wyoming, a few signs of improvement had begun to appear by the end of 1984. The state's drilling rig count continued to increase. In addition, it appeared that coal production would finish the year substantially above tonnages projected earlier by the Wyoming Geological Survey. It appeared that total state coal production would finish 1984 at about 129 million tons.

A Casper Star-Tribune analysis of wholesale and retail sales, moreover, indicated continued improvement through August 1984. For the ninth month in a row, the newspaper reported that Wyoming wholesale and retail sales had increased over year-earlier figures.

At the same time, Wyoming Travel Commission officials indicated that Wyoming's travel economy had improved 7.4 percent during the first six months of 1984, as compared to the first six months of 1983. Sales tax receipts reported by Wyoming's accommodations industry totaled $2.4 million during the first six months, an increase of approximately $200,000 over the same period in 1983.

At least one negative note, however, was sounded in a report prepared by two University of Wyoming Agricultural Economists. Andrew Vanvig and Alan Collins, both of the UW Division of Agricultural Economics, reported that prices for Wyoming ranches and agricultural lands declined in 1983 for the first time in 20 years. The report cited lower inflation rates, low product prices, and high interest rates as the major factors in the decline.

S.T. Mast, IPR

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Winter Minerals Outlook

MINERAL OVERVIEW

In the fall issue of the Wyoming Quarterly Update (vol. 4, no. 1), we provided a forecast of oil, natural gas, coal, trona, and uranium production for Wyoming. It now appears that 1984 production of oil, natural gas, and coal may exceed that forecast. Based on seven months of production records, Don Basko, supervisor for the Wyoming Oil and Gas Conservation Commission, believes that 1984 oil production should top 125 million barrels (we had forecast 124 million barrels) and that production of natural gas should be between 589 billion and 600 billion cubic feet (we had forecast 580 billion cubic feet). This is good news, as our forecasts in September already showed healthy increases over 1983. If these additional increases occur, oil production would be 3.4 percent above 1983, while gas production would be 9 percent to 11 percent above last year.

Coal production is far above expectations and will probably reach or exceed 129 million tons, which is 15 percent above 1983 and 9 million tons above our September estimate. This surprising increase in tonnage, however, is at least partially at the expense of price. Apparently a significant portion of the production gains in 1984 are spot sales at bargain prices (some as much as 30 percent below contract prices). To take advantage of low spot prices, many utilities are trimming the tonnages they take on long-term contracts to absolute allowable minimums and then buying the difference or make-up tonnage on the spot market. Although these actions boost production, they also reduce the taxable value of coal and consequently lower the taxes and royalties paid on the spot sale tonnages. As long as the coal market remains soft, these purchasing tactics are likely to continue (if not increase), and the soft market is not likely to go away before the early 1990s.

In the case of oil and natural gas, the production gains are also somewhat offset by price declines. Although prices paid for both Wyoming crude and natural gas have not fallen precipitously, there have been cuts in both the third and fourth quarters of the year. Further cuts are probable in both the fourth quarter of this year and again next year.

Gary B. Glass, State Geologist, Wyoming Geological Survey

OIL AND GAS UPDATE

Drilling activity has continued to increase in Wyoming. As of November 12, the rig count for the state stood at 131. Allowing for seasonal adjustments during the upcoming winter months, drilling should continue to follow this upward trend, especially in the oil-producing basins within the state.

The Wyoming Geological Survey just published a new 1:500,000 scale map of Wyoming which depicts oil and gas fields, pipelines, refineries, and gas plants. This colored map updates the 1980 edition of the "Oil and Gas Map of Wyoming" and adds all the new fields and field extensions of the early 1980s. The discoveries made during the last four years were numerous, and they are particularly obvious if the two editions are compared. As in the first edition of the map, each field is not only colored to show the predominant age of production, but is also annotated with the names of the producing formations.

The Minnelusa Formation is still the hot play in the Powder River Basin, with several recently announced discoveries. Diamond Shamrock reported a 200-barrel-per-day oil discovery 18 miles southeast of Gillette in early October; Lear Petroleum announced a 477-barrel-per-day oil discovery 16 miles southeast of Gillette in Late September; Propel Energy completed a 48-barrel-per-day oil discovery 24 miles northwest of Moorcroft in early November; and Cenex completed a 758-barrel-per-day oil discovery 1¼ miles west of Pickrel Ranch field southeast of Gillette in late August. This northeast portion of the Powder River Basin should remain a major exploration target for months, and even years, to come.

In the Overthrust Belt, development of the giant Anschutz Ranch East field continues with Amoco's recent completion of a new producer 14 miles south of Evanston, Wyoming. This well was tested at 12,639,000 cubic feet of gas and 1,379 barrels of 50 gravity condensate per day from Jurassic Nugget Sandstone.

Celsius Energy completed an offset to its Dripping Rock field discovery southwest of Rawlins on the eastern side of the Washakie Basin. Production was gauged at 18,500,000 cubic feet of gas per day from the Mesaverde Formation. Celsius is the unit operator, controlling 6,200 acres within the unit and 8,500 acres of the immediate area around the

unit.

The U.S. Department of the Interior recently announced new oil and gas rules pertaining to audits of oil and gas royalty payments. The new regulations provide for two methods of carrying out audits. First, audit authority could be delegated to approved states, with the federal government assuming 100 percent of the audit costs, or secondly, a cooperative audit program between federal and state governments could be established, with the federal government reimbursing the participating state 50 percent of the costs. The state of Wyoming has already requested delegation of auditing authority. These new rules also clarify some of the royalty payment responsibilities, provide for a six-year record keeping requirement and statute of limitations, and provide penalty assessments for late or erroneous reports.

The controversy over the federal oil and gas lease lottery system remains unresolved. Opponents of the lottery noted that total filing fees were down from $13.7 million in September 1983 to $5 million in August 1984. Proponents argue that the recession and the elimination of unwanted speculators account for the decline and that the higher filing fees and advance rental payments were bound to have that effect. Most observers do not expect a quick resolution of this controversy, and Interior officials have indicated that they want to try out the new lottery system further before making any more changes.

Oil companies involved with the development of the Amos Draw field in Campbell and Johnson counties recently requested that the field be developed by conventional techniques instead of gas reinjection processes which have been under consideration. In an October application to the Wyoming Oil and Gas Conservation Commission, the companies contended that the expensive, time-consuming reinjection process would make the investment submarginal, yielding at best an unattractive 5 percent return delayed over 15 years. The application was taken under advisement by the commission so that its staff could review the technical evidence presented at the hearing. In mid-November, the commission announced its decision to allow conventional production techniques. Although the gas reinjection process would recover about 3 million more barrels of oil than the conventional techniques, the commission ruled that leaving some oil in the ground is not wasteful if those resources are not economically recoverable.

Exxon's recently announced $500 million Shute Creek gas plant will be one of the largest carbon dioxide producing plants in the United States. Approximately two-thirds of the plant's production will be carbon dioxide (CO_2) and one-third natural gas. Earlier this fall, Chevron contracted for up to 900 billion cubic feet of CO_2 for use in an enhanced oil recovery project at Rangely, Colorado. Amoco has contracted for 181 billion to 191 billion cubic feet of CO_2, pending its decision to use CO_2 injection in Lost Soldier and Wertz fields north of Rawlins. In a related note, Pacific Power and Light (PP&L) will provide the electricity for Exxon's Shute Creek plant, according to a recent ruling by the Public Service Commission. PP&L had been in competition with Utah Power and Light for the right to service the facility.

The U.S. Bureau of Land Management's (BLM) latest competitive oil and gas lease sale was held on August 29, yielding record revenues to the federal and state coffers. The sale of 149 tracts yielded $12.4 million, surpassing the previous record of $7.2 million set in February of 1984. Exxon was the biggest spender, bidding about $8 million of the total. Two Campbell County parcels were the highest-priced, totaling $4.8 million and $2.3 million, respectively. Exxon was the successful bidder on both of these tracts, which are located in Ross field.

The Wyoming Oil and Gas Conservation Commission has proposed changes to its rules concerning seismic operations in Wyoming. One change would prohibit surface shooting closer than one mile to any inhabited dwelling and set a 50-pound limit on the shot size unless written consent of the owner was first obtained. The amendment also requires notification of all persons living within two miles of any shot.

Another change would require seismic companies to plug shot holes with coarse-ground, sodium bentonite plugging material during winter operations from November 1 through May 1 unless a specific variance is granted. Under the proposed amendments, seismic companies and contract hole pluggers will have to commence plugging operations within 30 days unless they are granted a variance.

A hearing on these proposed changes and amendments was set for December 11, 1984 at the commission's hearing room in Casper.

Alan J. VerPloeg, Petroleum Geologist, Wyoming Geological Survey

METALS AND PRECIOUS STONES UPDATE

Although major mining companies are searching for both large tonnage, low-grade stratiform gold deposits and low-grade "Carlin-type" micron gold deposits associated with black shales, only minor exploration activity for micron gold occurred during the past field season. This activity was centered in the Overthrust Belt of western Wyoming.

The principal exploration activity during the past field season was for stratiform deposits in Archean (more than 2.5 billion years old) supracrustal rocks. Some activity occurred in the South Pass, Copper Mountain, Laramie Range, Granite Mountains, Seminoe Mountains, and Hartville Uplift supracrustal belts.

The South Pass supracrustal belt, located at the southern edge of the Wind River Mountains, has a favorable tectonic setting for stratiform deposits. Several exploration groups were in the South Pass region during the past field season, and Freeport Exploration was consolidating a strong land position in the Lewiston and Miners Delight areas. It was also reported by the Laramie Boomerang (November 15, 1984) that Universal Equipment Company was negotiating with U.S. Steel Corporation to purchase the Atlantic City iron ore mine. According to the article, Universal "...is also talking with Freeport Exploration about a gold processing operation."

Placer mining activity in the South Pass region was restricted to small floating dredges, and the success of these ventures varied from individual to individual. One prospector recovered several small nuggets and considerable dust and flakes in Meadow Gulch near Miners Delight.

There was also underground exploration at several mines within the district. A local group of miners from Atlantic City secured access and reopened a few of the old mines in order to sample the principal gold-bearing shears and veins. Some companies toured the mines and collected their own set of samples for assay.

At the Carissa Mine near South Pass City, a Salt Lake City company cleared the primary shaft of debris and began dewatering the drifts and slopes on the five levels. Historically, the Carissa Mine was one of the two largest gold producers in the district.

The Geological Survey of Wyoming initiated a long-term project in the district, which will eventually produce a regional map of the South Pass supracrustal belt with special emphasis on economic geology. Initially, the project is designed to produce 7½-minute geologic quadrangles of segments of the belt. These 1:24,000 scale maps will later be complied into one regional map. The workings in all accessible mines will be mapped at 1:120 or 1:240 scales.

During the past field season, preliminary mine maps were prepared for the Dream and Wilson Bar adits near Lewiston and for the Cold Dollar, Diane, Soules and Perkins, Big Chief, Mary Ellen, Tabor Grand, Doc Barr, and Carrie Shields mines near Atlantic and South Pass cities. The historic Lewiston gold district was also mapped at 1:24,000 showing mines, prospects, and the principal veins and shear zones. Reconnaissance of the Lewiston Lake 7½-minute quadrangle, to the east of the Lewiston District, located a previously unmapped banded iron formation.

Copper Mountain is located in the Owl Creek Mountains near central Wyoming. During the historic past, this region has been explored for gold, silver, copper, feldspar, lithium, beryl, tungsten, uranium, and petroleum. In the 1984 field season, the area was again explored for stratiform gold deposits.

The supracrustal rocks available for exploration on the east flank of the Laramie Range near Garrett are limited. However, over the years this region has received a fair amount of prospecting for gold, talc, asbestos, chromite, and iron. 1984 was no exception, with at least one mining company conducting exploration in the area. The Geological Survey of Wyoming also conducted some reconnaissance studies of the Garrett area. The Geological Survey's preliminary field examination identified a northeast-trending, limonite-stained, micaceous quartzite within the supracrustal succession, which appears to host stratiform mineralization. Samples collected from one prospect pit within the quartzite contained pyrite and bethierite. A sample of limonite-stained, berthierite-bearing quartzite essayed 0.25 ounces of gold per ton.

In the Sierra Madre Mountains of southcentral Wyoming, some exploration was aimed at finding a silver deposit similar to the deposit at the Troy Mine in Montana. The Troy deposit occurs in a nearly flat-lying, 60-foot thick quartzite. The ore at the Troy Mine contains both silver and copper.

Exploration by at least two companies was focused on the Ferris-Haggarty Mine. The Ferris-Haggarty Mine was developed into a thick quartzite that has a 30° to 35° dip. Copper mineralization appears to be stratabound and partially mobilized. The few assay reports available on the Ferris-Haggarty show samples running 3.95 percent copper with a trace of

silver, and 4.6 percent copper with 0.03 ounces of silver per ton. One cupriferous quartzite sample tested by the Wyoming Geological Survey assayed 0.06 ounces per ton of combined gold and silver.

During this past field season, prospectors located a gold-bearing vein along the northern edge of the Big Creek District in the southern Medicine Bow Mountains. The Wyoming Geological Survey collected a channel sample across the vein. The sample assayed 1.4 ounces of gold per ton, and the prospectors are presently applying for necessary permits to conduct economic tests.

In other metal activity, the Cottonwood Creek gold placer mine, east of Jackson, operated during the summer of 1984. No production reports are available.

The Geological Survey of Wyoming continued searching the Laramie Range for diamondiferous kimberlite. The main activity of the Geological Survey is in the Pole Mountain-Happy Jack area to the east of Laramie and in the Sheep Rock District to the northeast of Laramie. Anomalous stream sediment samples have been located in both regions.

Apparently there is still industry interest in the Colorado-Wyoming diamond-bearing districts. It is reported that Superior Minerals may reopen its testing plant at Prairie Divide, Colorado, to test a diatreme from an undisclosed location. Diamond exploration has also been reported in the northern Medicine Bow Mountains of Wyoming.

W. Dan Hausel, Deputy Director, Wyoming Geological Survey

URANIUM AND INDUSTRIAL MINERALS UPDATE

Uranium

During the fall of 1984, Exxon Minerals Company closed the Highland Uranium Mill in the southern Powder River Basin. Although the Highland Mine was closed two years ago, Exxon had been milling ore which had been stockpiled in the mine. This closure represents the final shutdown of Exxon's operations.

There remain only four active uranium operations in the state. COGME continues to operate the Lucky Mc Mine in the Gas Hills and its Shirley Basin Mine. Getty Oil Company continues to mine uranium at its Shirley Basin Mine, and Bear Creek Uranium continues to mine at Bear Creek in the southern Powder River Basin.

The outlook for uranium mining remains poor. No improvement for this declining industry is seen until the 1990s, and any recovery at that time depends upon the development of more favorable economic conditions, as well as improved public opinion about the safety of nuclear power.

The American Mining Congress (AMC) believes the uranium industry is in its worst shape ever. Eighty percent of the national uranium industry work force has been laid off. AMC also believes that the industry has lost its viability and that there is no chance for growth. AMC closes its prediction by saying, "...this country will lose the energy independence once promised by nuclear energy."

Bentonite

Bentonite production in Wyoming continues to increase at a slow rate. Oil well drilling usually increases toward the end of a calendar year and should increase the demand for bentonite for drilling mud. The price of bentonite, however, remains depressed since all producers are operating well below plant capacity and under very competitive conditions.

Furthermore, new rules on taxable value, which have been proposed by the Wyoming Attorney General's Office, could increase the taxes assessed on bentonite. The new rules may disallow deductions for transportation costs incurred between the mine and the mill. The Wyoming Mining Association notes that some bentonite is hauled as far as 70 miles before milling.

Trona

Trona is Wyoming's most valuable nonfuel mineral. Currently, the trona industry is slowly recovering from the 1982 depression. Production in 1983 increased 4 percent over 1982 due primarily to increased exports. Although domestic consumption of soda ash (refined trona) has increased in 1984, exports have decreased. As a result, 1984 trona production is close to 1983 levels, and may even be running slightly behind last year.

Domestic consumption is expected to increase, but unless exports increase, the trona industry is expected to show only slight growth.

New rules on taxable value proposed by the Attorney General's Office may substantially increase taxes paid on trona. Traditionally, taxes have been based on the value of trona ore (about $10.00 per ton). The new rules may assess the tax on the soda ash value after processing. Soda ash is currently valued at $69 per ton.

Other Industrial Minerals

Production of other industrial minerals (gypsum, limestone, sand and gravel, etc.) continues to increase as the local economy improves and construction increases. Total 1984 production of these industrial minerals should be about 5 percent greater than 1983.

As mentioned earlier this year, Rocky Mountain Energy Company is testing a zeolite-bearing horizon in southwestern Wyoming. A few hundred tons of ore have been shipped to a laboratory in Indiana. Zeolites are natural ion exchangers with properties similar to water softener beads and may be useful in water softeners, kitty litter, and feedlot deodorizers. They may also have uses in the cleanup of natural and industrial pollutants.

Perlite

Wyoming has two perlite processing operations: a packaging operation, Western Perlite in Green River, and a processing plant operated by Harborlite, Inc., west of Green River, which supplies perlite to the trona industry for use as a filter aid during the trona refining process.

Perlite is a glassy volcanic rock containing 2 percent to 5 percent water. When heated, this rock will expand rapidly. The expanded material, also called perlite, has low density, high silica content, and a large surface area. These properties make it useful in a variety of industrial applications.

Perlite processed in Wyoming is mined in Arizona and Idaho. There are no known occurrences of perlite in Wyoming. Glassy volcanic rocks exist in Wyoming in a few places outside of Yellowstone Park, but these have not been tested for their water content and expansion properties.

Ray E. Harris, Uranium and Industrial Minerals Geologist, Wyoming Geological Survey

COAL UPDATE

It now appears that Wyoming coal production for 1984 will exceed the 120 million tons predicted earlier. Based on coal deliveries filed with the Federal Energy Regulatory Commission for the first eight months of 1984, production is nearly 9 million tons ahead of production for the same period in 1983. If these production rates continue for the last four months of the year, and if unreported tonnages remain at about 5 million tons (as they have the last two years), Wyoming's production may exceed 129 million tons in 1984.

The production increase seen in the state in 1984 has also occurred nationwide: the U.S. Department of Energy's Energy Information Administration (EIA) reports that a record 447.9 million tons of coal were produced in the first half of 1984, an increase of 18.5 percent over the first half of 1983. The increase was attributed to a rise in electric utility consumption and a buildup of coal stocks in anticipation of a possible strike by the United Mine Workers. The National Coal Association predicted in July that the total U.S. production in 1984 would be 853 million tons (an all-time record) and that total U.S. coal consumption would be 840 million tons, also a record. The EIA predicts (November 1984) that national coal production in 1984 will be 871.5 million tons and national coal consumption will be 795.8 million tons.

National coal production figures for 1983 are not available in a recently published report entitled, "Coal Production--1983," by the Energy Information Administration (EIA, 1984). This publication confirms that Wyoming was the third largest coal-producing state in the nation in 1983 with 112.2 million tons of production, behind only Kentucky (128.7 million tons) and West Virginia (114.3 million tons). Wyoming has ranked third in total coal production and first in production from surface mines since 1980. In 1983, Wyoming produced about 14 percent of the nation's total coal production of 782.1 million tons, about 23 percent of the nation's total surface production of 478.3 million tons, about 69

percent of the nation's subbituminous coal, and about half the coal produced in the Western Coal Production Region. The total U.S. production was down 6.7 percent from the record high 838.1 million tons produced in 1982.

Coal mine productivity in Wyoming has increased each year since 1979, and 1983 was no exception. Coal mine productivity, expressed by short tons of coal produced per miner per hour (or per day), was 8 percent higher in 1983 than the previous year for underground mining, 5 percent higher for surface mining, and nearly 6 percent higher overall. Productivity from Wyoming's only underground mine (Carbon County No. 1) is slightly higher than the national average and about the same as the Western Region average. Surface mine productivity is about three times the national average and about 1.3 times the average for the Western Region. Overall productivity for the state's mines in 1983 was 94 short tons per miner per day, compared to about 61 short tons per miner per day for Western Region mines and about 21 short tons per miner per day for all mines in the United States. Montana is the only state with a productivity rate higher than Wyoming's because less productive mines in southern Wyoming (including an underground mine) are included in Wyoming's overall productivity. The differences in productivity between southern Wyoming mines and Powder River mines reflect inherent geologic differences between the two areas. The mined coals in the Powder River Basin are not only much thicker than the coals mined in southern Wyoming, but they are nearly flat-lying. Consequently, mining methods in the two areas are quite different.

The EIA report also summarizes recovery rates (percent of a mine's reserves that can be recovered) and utilization rates (a measure of a mine's production rate to a mine's productive capacity) for each state and the nation. Wyoming mines that were active in 1983 contain nearly 6 billion tons of recoverable coal reserves, about one-half of the 12 billion tons in the Western Region and about one-fourth of the nation's 24.5 billion tons. It is estimated that Wyoming's overall recovery rate is nearly 90 percent, slightly less than Montana and North Dakota's rate (because of the influence of an underground mine and southern Wyoming mines), but well above the national average of about 73 percent. The recovery rate for underground mining in Wyoming is about the same as that for the Western Region (55.63 percent), but less than the overall rate for the nation. This is mainly because coal beds in the Western Region are much thicker than coal beds in the Eastern and interior regions, and often part of the coal remains in place on either the roof or the floor of the mine for safety reasons or for better operating efficiency.

The daily productive capacity for the United States coal industry was 3.8 million short tons at the end of 1983, and the average daily production of coal in 1983 was 3.4 million tons; the utilization rate (the percentage of total capacity represented by production) for the United States was 89.0 percent. This is a decrease from the 89.5 percent reported in 1982 and probably reflects a weakened coal market in 1983. The daily productive capacity for Wyoming was 479,000 short tons in 1983, up slightly from the 441,000 short tons in 1982. Wyoming mines operated at about 85 percent of total capacity in 1983, a slight decrease from the 85.7 percent recorded in 1982.

The state's annual production would be about 133 million tons if all the mines in the state operated at full productive capacity. Bear in mind that productive capacity is only what could be produced under current market conditions--if Wyoming coal mines were able to sell all the coal they could possibly produce today and could operate at maximum announced mine capacity, the annual production might be as high as 243 million tons (Wyoming Geological Survey, 1984).

In 1983, average mine prices for Wyoming coal dropped slightly from 1982, according to the EIA. The average mine price for all coal in the state in 1983 was $12.63 per ton, compared with $12.75 per ton in 1982. Coal from Carbon County, including the state's only underground-mined coal, was priced at an average of $29.81 per ton in 1983, up 6.5 percent from the $27.99 per ton in 1982. However, the price for surface-mined coal from Campbell County, which represents the bulk of Wyoming's production, dropped 2.4 percent from $9.88 per ton in 1982 to $9.64 per ton in 1983.

Another indication that the price of coal has declined slightly is the assessed value of the coal as determined by the state's Ad Valorem Tax Division, Department of Revenue and Taxation. The average value of Wyoming coal produced in 1982 and assessed in 1983 was $10.71 per ton (Ad Valorem Tax Division, 1983). For coal produced in 1983 (assessed in 1984), the average value was $10.67 per ton (Ad Valorem Tax Division, 1984). This is the first time since 1967 that the assessed value per ton has not increased each year.

According to the U.S. Department of

Interior's Minerals Management Service (1984), the average value of federal coal produced in the state has also decreased. The total value of federal coal from Wyoming in 1982 was $788.4 million, for 63.6 million tons of coal. In 1983, the total value was $787.2 million, for 68.0 million tons of coal. The average value per ton has declined from $12.39 per ton in 1982 to $11.58 per ton in 1983, a decrease of 6.5 percent. The decreased value of the coal has caused a drop of over $6 million in revenues collected from federal coal leases in Wyoming. Wyoming production accounted for 64 percent of all federal coal produced in the nation in 1983.

Other developments in the state since the last update are related to increased use of coal in smaller industrial and commercial installations. In Sheridan County, Perkins Power Company has announced its plans to reactivate the 12-megawatt Acme power plant north of Sheridan. Nine million dollars of industrial revenue bonds have been issued to finance the project, and the company is looking for about 85,000 tons of coal per year to burn in the plant, which has not operated since 1976. The company plans to employ about 55 people in the power plant and in an associated hydroponic greenhouse which will be heated by excess steam produced by the plant. The power would be sold to Montana Power Company and will require a 62-mile long transmission line to Hardin, Montana.

It now appears that Fremont County will have the state's newest coal mine, the Muddy Creek Mine, located about 40 miles northwest of Riverton. The mine is a small strip mine that will produce high quality lump and stoker coal for local consumption. The mine, which will employ several people to mine the coal as well as a contract trucker, expects to begin retail sales this winter.

Another industrial fuel user, Holly Sugar Company's sugar beet processing plant in Torrington, recently completed a $3.5 million conversion project from natural gas to coal. The company could use up to 33,000 tons of stoker coal this winter and expects to cut its fuel expenses in half by using coal. In the 1984-1985 season, Holly has purchased coal from NERCO's Spring Creek Mine in Montana, the Rosebud Mine at Hanna, Wyoming, and from an unidentified mine at Walden, Colorado. They apparently have a contract with NERCO's Antelope Mine in the southern Powder River Basin for their 1985-1986 season.

In other coal market news, it now appears that Big Horn Coal Company's 3 million-ton-per-year contract with Commonwealth Edison, which has deferred about 1 million tons per year from Big Horn already, will not be renewed when it expires in 1988. Commonwealth Edison evidently has an oversupply of coal at the present time and expects even more oversupply by the late 1980s when its four new nuclear reactors come on line. A coal industry analyst has estimated that when Commonwealth's nuclear plants begin operations, Peter Kiewit Sons', Inc. annual shipments of 13.6 million tons of low-sulfur western coal (mined in Wyoming and Montana) could be cut in half.

A controversy, however, is now raging as to the future of these plants. On one hand, Commonwealth claims the new plants will save consumers money because uranium is cheaper than coal as a fuel. This claim is substantiated by data from the Atomic Industrial Forum trade group: uranium fuel costs are estimated at 0.6¢ per kilowatt hour compared to coal fuel costs of 2¢ per kilowatt hour. On the other hand, a study funded by the United Mine Workers and several Illinois consumer groups claims that by canceling the proposed nuclear plants, four coal-fired plants could be built instead, saving consumers $1.86 billion, boosting Illinois coal production by 5 million tons per year, and creating 1,500 new coal mining jobs by the year 2006. A study by the Electric Power Research Institute also concluded that power from nuclear reactors coming on line from 1983 to the early 1990s would cost 50 percent more than coal-generated power.

In federal coal leasing news, China Butte Coal Company, the holder of a 5,975-acre federal coal lease in southern Wyoming, recently filed for bankruptcy. The company acquired the China Butte lease in October 1981 in one of the first lease sales held in the state since federal coal leasing resumed after the leasing moratorium in the early 1970s. Evidently, the company has been in default on a $358,000 payment (one of five payments on the bonus bid) to the U.S. Department of the Interior since March of this year and had asked Interior to defer the last three payments. Before China Butte declared bankruptcy, the Department of Interior was moving to terminate the lease for default on the bonus payment. By filing a Chapter 11 bankruptcy, China Butte is granted protection and can prevent Interior from canceling the lease or demanding immediate payment of bonus and rental payments. China Butte Coal Company lists its principal asset as the China Butte lease and its debts as the outstanding lease bonus and rental payments ($1 million) due BLM, as well as $4 million due the First National Bank of Chicago.

Richard W. Jones, Coal Geologist, Wyoming Geological Survey

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Winter Agricultural Outlook

High real interest rates and low farm prices continue to cause concern for the agricultural community as we move into 1985. The results of these continuing agricultural depressing factors have been declining land values and eroding equities across the agricultural sector.

The agricultural community is becoming more painfully aware that national trade policies and monetary and fiscal policies have an ever-growing impact on agriculture.

The strong U.S. dollar makes the goods we import become higher priced on the world market. The U.S. dollar has appreciated about 8 percent against major trading partner currencies the last four months and by roughly 40 percent over the past three years.

Contributing to the strong dollar has been the large U.S. federal budget deficits. These record deficits have led to record high real interest rates. Agricultural borrowers carrying variable interest rate real estate and production loans have been forced to shift ever-increasing portions of income to service these debts.

The high real interest rates and lower real prices have had a dramatic impact on land prices. Recent surveys indicate almost across-the-board declines in land prices that in many instances approach 50 percent declines over the past four years. This has eroded the equity position of many producers and has restricted credit acquisition by large numbers of hard-pressed agricultural producers. Declining land prices are almost unprecedented since the Depression years of the 1930s, with no immediate turnaround in sight.

Turning to the outlook for the coming year, there are a few glimpses of light among the continuing dark clouds.

Despite the large trade imbalances, real GNP growth should continue throughout 1985. This should lead to declines or at least stable unemployment rates. Real disposable consumer income should be marginally higher, and a higher percentage of these incomes should be spent on food, including red meat products. Thus, although total meat supplies will continue to be historically large during 1985, improved meat demand should move livestock prices higher. In addition, lower feeding costs as a result of higher feed grain production and lower exports will help improve prices for Wyoming's cow-calf and stocker operations.

On the grain production side, however, the outlook is less optimistic. The strong dollar has weakened export prospects for food and feed grains. Increased U.S. production during 1984 has rebuilt carry-over stocks to historically acceptable levels. Although some weakness for the dollar may be on the horizon, it is unlikely that such weakness will be sufficient to cause much strength in grain exports in 1985. Grain producers will be searching for acceptable methods of reducing supply to balance with effective demand.

Another big unknown that clouds the horizon somewhat is inflation. A number of factors currently existing in the economy point to increased inflationary pressures in late 1985. The magnitude and the effect it will have on production costs are difficult to predict at this time; however, there is little doubt that the large U.S. federal deficits and the accompanying demands in the credit market to finance them will lead to pressures for rising interest rates in 1985. The prime rate is expected to move one to two percentage points higher without the effects of inflation in 1985. If inflation does increase by the latter part of the year and into 1986, further increases are projected for interest rates.

In summary, livestock producers can look for improved prices in 1985 over comparable periods in 1984. Feeder calves and yearlings should be $2 dollars to $3 dollars stronger over year-ago levels into green grass time. Lower grain prices should keep these prices strong throughout 1985. Grain prices will be weaker throughout 1985, with inflationary factors impacting production costs later in the year.

Robert D. Carver, University of Wyoming

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Job Openings Outlook

Small Engine Repairers

In Wyoming, employment for small engine repairers depends upon replacement of those who leave the occupation and consumer demand for small gasoline and diesel-powered machines, and for vehicles used in work and leisure. Presently, a shortage of qualified small engine repairers, especially motorcycle repairers, exists in Wyoming. Rising gasoline prices are causing people to look for less expensive forms of transportation resulting in a rising demand for repairers. Prospects are best for individuals who can work on a variety of engines or for those who are willing to learn and attend specialized classes and seminars to expand their skills.

Small engine repairers service and repair gasoline or diesel engines used in such products as motorboats, motorcycles, chain saws, and power lawn mowers. Repairers work mainly indoors, although some specialists work both indoors and outdoors. They are usually required to furnish their own hand tools costing from $100-$500 for a basic set to $2,000-$5,000 for specialized tools.

High school graduation is the minimum education requirement, although employers prefer repairers with several years experience. Employers who hire trainees look for individuals who have a mechanical aptitude and have interests related to their specialty, such as motorcycle riding or boating. Generally, it takes from 2 years to 3 years before trainees become fully qualified mechanics.

Most motorcycle repairers are paid on a commission basis. Trainee wages range from $3.35-$4.65 per hour. Entry wages for experienced repairers range from $6.00-$7.00 per hour. Maximum wages range between $7.50-$12.00 per hour.

Office Machine Repairers

In Wyoming, there is a shortage of qualified office machine repairers. Office machine equipment is becoming increasingly sophisticated. Advancement in technology has resulted in a change from mechanical to electronic office equipment. Because of this increasing sophistication, office machine repairers need a background in electronics. These advances in technology and the higher degree of knowledge has created a shortage of qualified office machine repairers. In addition, the use of office machines in business and government is expected to increase. Opportunities are good for repairers with a background in electronics or individuals who can adapt to new technological changes.

Office machine repairers service and repair office equipment used for correspondence and business transactions. Repairers usually specialize in servicing one type of machine such as typewriters, calculators, adding machines, cash registers, postage meters, or copying equipment. Repairers spend much of their time away from their office in customers' offices.

Wages vary considerably with the employer and the level of skill. Earnings are highest for individuals skilled at repairing several different machines, and for those who combine sales with repair work. Trainees earn from $4.00-$5.00 per hour. Earnings for experienced repairers range from $5.80-$7.50 per hour. Maximum wages range between $9.50-$15.00 per hour.

Employers prefer individuals with experience or formal training in office machine repair or a related field such as electronics. Knowledge of mechanics, electricity, or electronics is necessary for this type of work.

Job skills are usually acquired through one-year certificate and two-year associate degree programs offered at community colleges, or through an apprenticeship program. Few employers provide informal on-the-job training.

For further information, contact Diane Latos, Wyoming Career Information System, Box 3808, University Station, Laramie, WY 82071, (307)766-6189.

Diane M. Latos, Wyoming Career Information System

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Wyoming Coincident Indicator Index

The Wyoming economy cooled off during the second quarter of 1984, according to the Wyoming Coincident Indicator Index (WCII).

The WCII, computed by the Division of Research and Statistics, Department of Administration and Fiscal Control (DAFC), is derived using economic variables whose movements generally coincide with movements in the overall economy. It is a composite index which uses four economic variables: (1) Wyoming total sales and use tax collections in 1972 dollars; (2) Wyoming state total insured wages paid in 1972 dollars; (3) Wyoming state total employment; and, (4) an industry index comprised of one economic variable from each of Wyoming's three major industries. The three industries are agriculture, mining, and tourism, and the restrictive variables are: (1) prices received by Wyoming farmers and ranchers for all commodities; (2) Wyoming drilling rig count; and, (3) Wyoming motor fuel gallonage sales. The historical period over which the index is calculated is January 1972 to June 1984.

Presented on the accompanying graph are the plots for three time series, one for the index using seasonally adjusted data, one for the index using data which has not been seasonally adjusted, and one for the U.S. Coincident Indicator Index. The unadjusted index is presented to show the seasonality of the Wyoming economy. The U.S. index is shown in order that it might be compared to the Wyoming index. The more important Wyoming index, and the one with which all further analysis and description will be concerned, is the seasonally adjusted index. In this index, turns up and down are caused by factors other than seasonality. The base month is January 1972, which has an index value of 100. An index value doesn't have any meaning in and of itself but is valid only when compared to another value from the same index.

As was reported in last quarter's report, the Wyoming economy grew from 1972 until December 1981, ignoring the U.S. recessionary periods of 1974 and 1980, but declines were registered in 1982 and the first half of 1983. From the low in July 1983, the index improved steadily until February 1984. Over this time period, the index increased 9.54 index points, or 6.92 percent. But from February 1984 to June 1984, it fell 5.48 index points, or 3.9 percent. This decrease in the seasonally adjusted index has come despite steady increases in non-seasonally adjusted employment and wages paid. Employment has registered gains every month from January 1984 to June 1984, and wages were higher in the second quarter of 1984 than in the first quarter of 1984. However, when these time series are adjusted for seasonal fluctuation, they show decreases over the same time period. This is possible because the rate of growth in these economic time series has slowed over the last few years, which results in lower absolute numbers. The seasonal adjustment factors, called specific seasonal relatives, were computed over the time period when the economy was booming, and when they are applied to numbers which are much lower in magnitude than those which would have occurred had there been no recession, the results are seasonally adjusted figures which reflect the lower growth rate.

While sales and use taxes have not increased steadily over the second quarter, they have registered some gains; but again after seasonal adjustment, those gains are reduced substantially. Over the quarter, gasoline sales have remained relatively stable, agricultural prices dropped off, and the rig count was down from the previous quarter. The net result was a drop in the seasonally adjusted index and a slight downturn in the unadjusted index. While the seasonally adjusted index indicates a decline in Wyoming's economic activity, the unadjusted index suggests that the downturn is not serious. In light of the fact that several of the major individual series have improved throughout the second quarter, the downturn in the index is not being considered a severe threat to Wyoming's economic health.

Steve Sommers, DAFC

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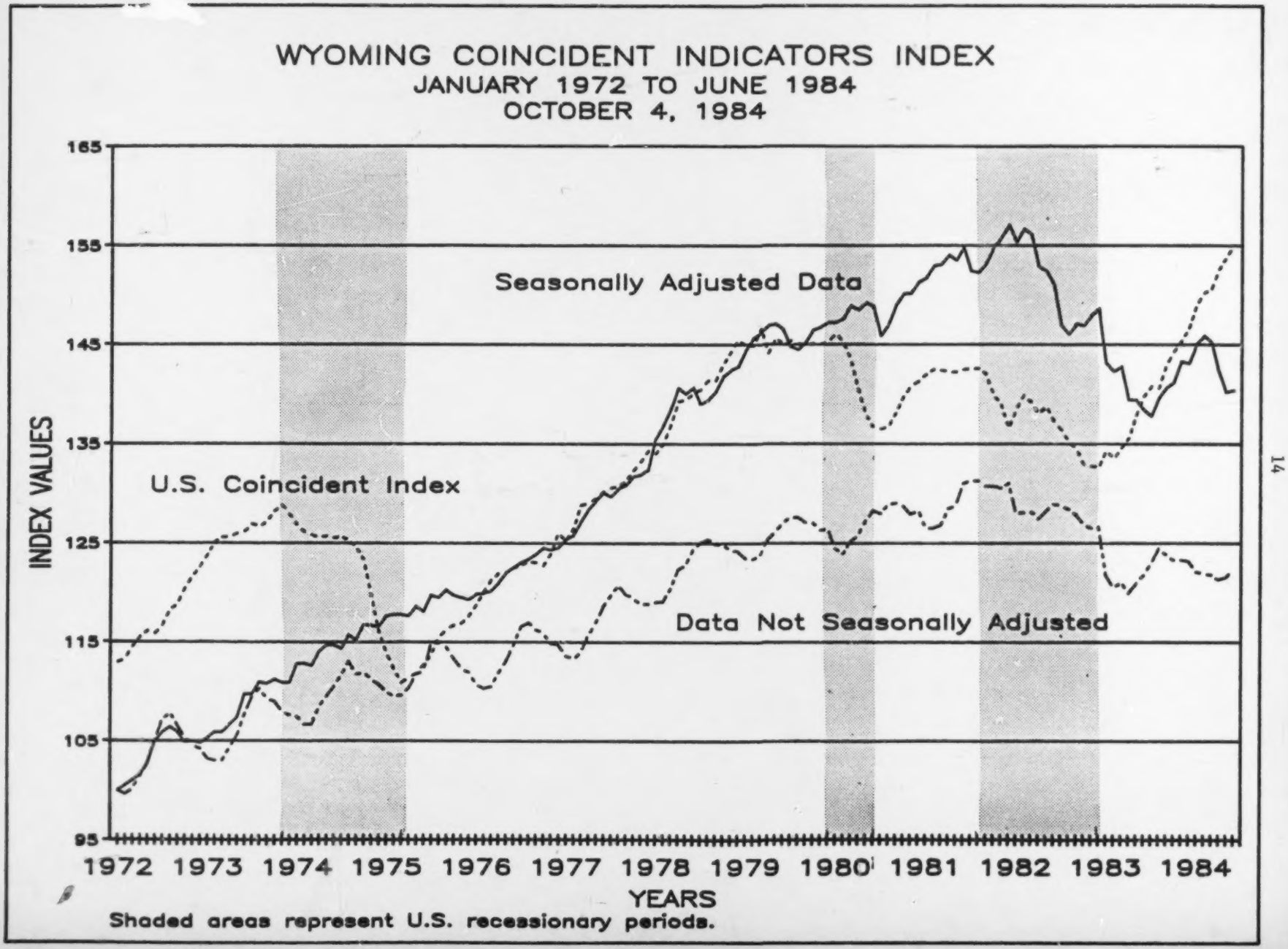

WYOMING COINCIDENT INDICATORS INDEX
JANUARY 1972 TO JUNE 1984
OCTOBER 4, 1984
INDEX VALUES
165
155
145
135
125
115
105
95
Seasonally Adjusted Data
U.S. Coincident Index
Data Not Seasonally Adjusted
1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984
YEARS
Shaded areas represent U.S. recessionary periods.

INDUSTRY PROFILE

A Wyoming Oil Review

INTRODUCTION

Among the economic tall timbers of the Wyoming mining sector, none stands so tall as the oil industry. Even despite production declines in recent years, the pre-eminent status of oil in Wyoming's overall minerals picture has been maintained. In 1984, valuation (on 1983 production) of the state's total oil output was $2,986,418,942, or 53.54 percent of the state's total minerals valuation.

The purpose of this article is to trace the development of the oil industry in Wyoming. This will be accomplished by looking first at state oil development in general and then by examining growth of the oil industry within particular regions throughout the state.

OVERVIEW

Long before the white man appeared on the Wyoming high plains, Indian tribes living in the state had discovered oil that appeared at the surface in naturally occurring seeps and springs. The Indians developed many uses for the dark substance. Oil was used as a liniment for aching muscles and as a nostrum for injured horses; combined with buffalo chips or dried grass, oil provided the fuel for easily ignited campfires.

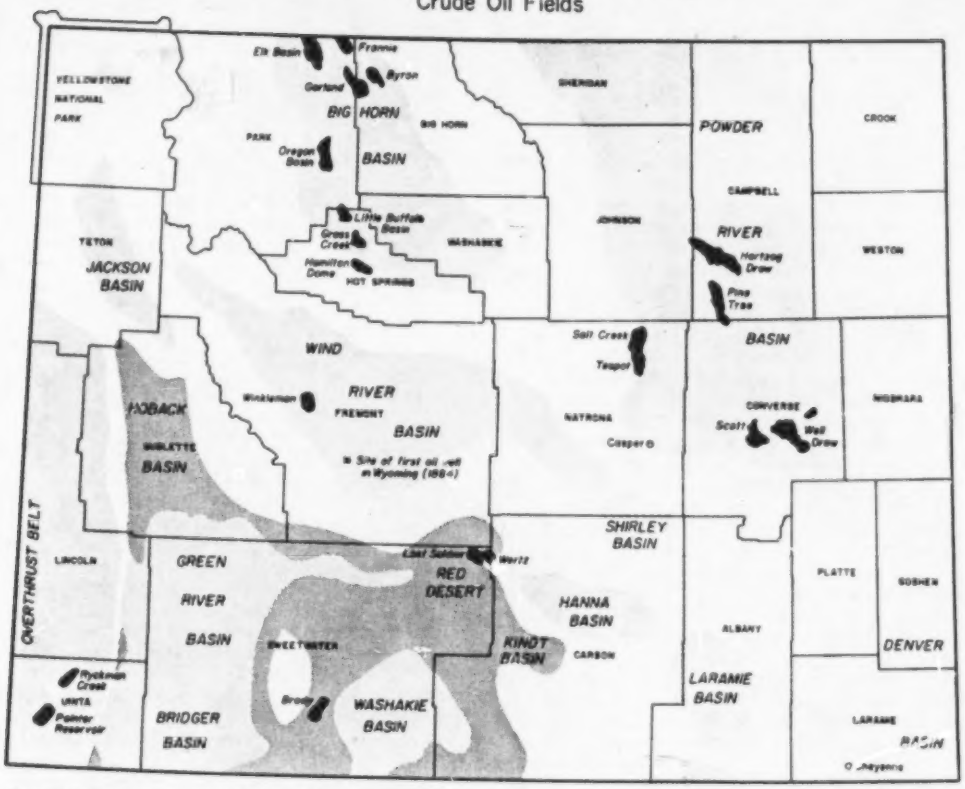
The first written account of oil in Wyoming dates to the expedition of Captain B.L.E. Bonneville in 1833, referring to a site on the Popo Agie River near Lander called the "Great Tar Spring." In his book, "The Adventures of Captain Bonneville in the Rocky Mountains and the Far West," (published in 1837), Washington Irving penned the first description of oil in the state:

> "Proceeding down along the Popo Agie, Captain Bonneville came again in full view of the 'Bluffs,' as they were called, extending from the base of the Wind River Mountains far away to the east, and presenting to the eye a confusion of hills and cliffs of red sandstone, some peaked and angular, some round, some broken into crags and precipices and piled up in fantastic masses; but all naked and sterile. There appeared to be no soil favorable to vegetation, nothing but coarse gravel; yet over all this isolated barren landscape were diffused such atmospherical tints and hues as to blend the whole into harmony and beauty.
>
> In this neighborhood, the captain made search for the 'great tar spring,' one of the wonders of the mountains, the medicinal properties of which he had heard extravagantly lauded by trappers. After a toilsome search, he found it at the foot of a sand bluff, a little to the east of the Wind River Mountains, where it exuded in a small stream of the color and consistency of tar. The men immediately hastened to collect a quantity of it to use as an ointment for the galled backs of their horses and as a balsam for their own pains and aches. From the description given it, it is evidently the bituminous oil, called petroleum or naphtha, which forms a principal ingredient in the potent medicine called British Oil. It is found in various parts of Europe and Asia, in several of the West India Islands and in some places of the United States. In the state of New York, it is called Seneca Oil, from being found near the Seneca Lake."

The first commercial use of oil in Wyoming apparently occurred in 1851. From a seep along Poison Spider Creek (located west of present-day Casper), Jim Bridger, Kit Carson, Cy Iba, and others apparently extracted the oil, mixed it with flour, and sold it to emigrants for use as axle grease.

Wyoming's first discovered oil field, the Dallas Dome, was drilled in 1884 in the immediate vicinity of the "Great Tar Spring" explored by Captain Bonneville a half century earlier. Mike Murphy, an ex-gold prospector, can lay claim to being Wyoming's first successful wildcatter. Working with pick and shovel, then switching to a spring drill, Murphy found oil locked within a fracture

Wyoming's Major Basins and Twenty Largest*
Crude Oil Fields



Adapted from the Wyoming Oil & Gas Map, The Geological Survey of Wyoming.
*Based on 1983 production (Wyoming Oil & Gas Conservation Commission)

system of the Chugwater Formation at 300 feet. Press accounts of the day described the first well as a "spouter" capable of producing 200 barrels of oil "of superior lubricating and illuminating quality" per day. Two additional wells subsequently were drilled.

The oil produced from the first Dallas Dome wells was hauled by wagon to Rawlins, where it was sold as a lubricating fluid at stations along the Union Pacific Railroad at a price of $.26 per barrel. It wasn't long, however, before competition from refined eastern oils forced the fledgling Dallas Dome enterprise to cease operations. Thus, Wyoming's first producing field for a time lay dormant.

Interest in the Dallas Dome field was renewed in 1901, when the railroad was extended to Lander, thus providing transportation access to distant markets. Various companies proceeded with development of the field until the mid-1940s, when control was acquired by the W.H. Barber Company. In the 1950s, the field was purchased by Pure Oil Company, then subsequently sold to Union Oil Company of California in the mid-1960s. Union Oil Company still operates the field today, including some of pioneer wildcatter Mike Murphy's first wells. Since production began in 1884, more than 10 million barrels of oil have been recovered from the Dallas Dome field.

At about the same time as the Dallas Dome discovery, the first placer claims were being filed for the Salt Creek area north of Casper. These claims led to the discovery of one of the largest oil fields in the United States in 1889. Discoveries in the Salt Creek field established Wyoming as the oil capital of the Rocky Mountains and transformed Casper from a sheep and cattle center to an oil town.

As development in the Salt Creek field continued, pipelines replaced wagons as the means for shipping oil. Pennsylvania Oil and Gas Company built the state's first refinery in

BEST AVAILABLE COPY

Casper in 1895.

As the Automobile Age dawned at the turn of the century, the state experienced its first major oil boom. Companies including Continental Oil, Standard Oil, and Ohio Oil joined the rush for the state's "black gold."

The first oil boom was a rough-and-tumble era of state history. Lawyers defined a legitimate claim as any piece of ground a man could take and hold. Companies staking mining placer claims thus "legitimized" their rights with claim shacks and armed guards. By the 1920s, the violence and litigation had grown so intense that the U.S. Congress repealed the controversial Placer Claim Law and instituted a system of competitive bidding in its place.

Despite the violence and conflict, the period from 1900-1920 was a time of prodigious drilling efforts, in which some of the state's largest fields were discovered. These fields included the Garland (1906), Oregon Basin (1912), Elk Basin (1915), and Lost Soldier (1916) fields.

Although the oil strikes of the first oil boom pointed to tremendously large reserves, Wyoming lacked close geographic proximity to major markets, and rail transportation to major population centers was costly. As a result, Wyoming found itself unable to compete with oil found nearer large population centers. By the 1930s, the price of Wyoming oil dropped as low as $.10 per barrel.

The Second World War, however, stimulated demand and provided the impetus for renewed oil activity in the state. The war years began a 20-year period of generally increasing oil production, swelling from 25.7 million barrels of total production in 1940 to 133.9 million barrels in 1960. Large new fields also were discovered. In 1943, the Steamboat Butte field was discovered in Fremont County, a field which has produced 82 million barrels of oil to date. Exploration and drilling in 1950 resulted in the discovery of the Glenrock South field in Converse County. To date, the Glenrock South field has produced 72 million barrels of oil.

The 1960s witnessed significant shifts in the search for oil, as high technology increasingly was brought to bear in the search for new reserves and in efforts to squeeze more oil from existing fields. Among large discoveries made during the 1960s were the Hilight field (1969) in Campbell County and the Madden gas field (1969) in Fremont County. Despite applications of new technology, however, oil production during most of the 1960s reached a plateau, experiencing alternating increases and declines in production. Increases from previous-year production levels were experienced during six years of the decade, while decreases were experienced in four years. The number of declines from previous-year production levels experienced during the decade of the 1960s matched the total number of such declines experience during the 27-year period between 1934 and 1961. The trend was a precursor of things to come, when declines would generally overshadow increases during the 1970s and 1980s.

State oil production peaked in 1970 at 155.7 million barrels, pushed ahead by the discovery and development of large stratigraphic traps in the Powder River Basin. In recent years, the bulk of new exploration and development has centered in the Powder River Basin. During the first six months of 1984, Campbell, Crook, and Converse counties--Powder River Basin counties all--were among the top 10 counties in drilling activity in the Rocky Mountain region. At present, much of the drilling activity is occurring in the Amos Draw area of western Campbell County.

Despite the upsurge in Powder River Basin activity, as well as new activity in the Overthrust Belt of western Wyoming, total state oil production has generally declined since its 1970 peak. The declines can be attributed to the rapid depletion of Wyoming's large older fields, such as the Salt Creek field in Natrona County. Despite new discoveries, Wyoming to a large extent still relies on production from its older fields. According to 1980 data complied by the Petroleum Association of Wyoming, 43 percent of total oil production was derived from the state's 10 largest fields, the average age of which was 51 years.

In 1983, taxable oil production totaled 110,420,981 barrels, up 2.19 percent from 1982 production of 108,055,462, according to Department of Taxation and Revenue figures (taxable production is gross production minus federal, state, and tribal royalties). Gross production in 1983, according to the Wyoming Oil and Gas Conservation Commission, was 120,979,721 barrels, an increase of 1.9 percent. In either case, the 1983 production increases reversed a steady 2.3 percent decline in Wyoming oil output that had existed since 1978.

In order of production magnitudes, the largest oil-producing counties in 1983 were Park, Campbell, Uinta, Sweetwater, Hot Springs, and Natrona counties.

While total state production has generally declined in recent years, valuation on Wyoming's oil production has soared. Until 1971, oil from countries represented by the Organization of Petroleum Exporting Countries (OPEC) sold for about $2.00 per barrel. Thereafter, however, OPEC began raising its prices, until the price of oil had climbed to $12.00 in 1974. At the same time, oil from domestic sources was allowed to rise in price to a regulated level in an attempt to stabilize the market. At first, a two-tier pricing system based on "new" and "old" oil was instituted. "Old" oil was considered oil from wells drilled prior to 1973, while "new" oil was from wells drilled after that time. With the enactment of the Energy Policy and Conservation Act of 1975, the price of domestic oil moved from less than $3.00 per barrel prior to 1973 to over $12.00 per barrel for "new" oil in 1976. When controls were entirely lifted in January 1981, the impetus was

provided for even further price increases.

As noted earlier, total 1984 valuation (on 1983 production) was $2,986,418,942, representing 53.54 percent of the state's total mineral valuation. Total 1984 valuation was down 6.56 percent from 1983 valuation, due largely to lower crude oil prices.

The outlook for state oil production during the remainder of the decade is mixed. According to forecasts produced by the Wyoming Geological Survey, crude oil production in the state is expected to rise to 119.1 million barrels by 1986, before declining once again to about 113 million barrels by the end of the decade. Exploration activities are expected to focus on the stratigraphic traps in the Powder River Basin and on the subtle, deep structural traps in the Overthrust Belt. Valuation on production is expected to stabilize or possibly decrease slightly in the short-term, although oil is expected to remain the state's most valuable mineral product.

BIGHORN BASIN DEVELOPMENT

The Bighorn Basin encompasses an area which includes Washakie, Park, Hot Springs, and Bighorn counties. It is a deep geological basin entirely surrounded by mountains: the Absaroka Mountains to the northwest, the Bear Tooth Mountains of Montana, the Bridger Mountains to the southeast, and the Bighorn Mountains to the north rig the area. In total, the Bighorn Basin covers a 12,000-square-mile area in northwestern Wyoming.

The presence of oil in the Bighorn Basin was first discovered in a natural oil spring alongside the No Wood River near Bonanza. Historically, the oil produced from the spring had been used by Indians, explorers, and early settlers. In the late 1880s, Winfield S. Collins, a Douglas attorney and surveyor, took an interest in larger scale development of oil in the area. In 1888, Collins hauled a drilling rig from Douglas to Bonanza, drilled a

Table 1: Historical Oil Production, 1894-1983

Year	Gross Bbls.	Year	Gross Bbls.	Year	Gross Bbls.
1894	2,369	1924	39,498,000	1954	93,533,000
1895	3,455	1925	29,173,000	1955	99,483,000
1896	2,878	1926	25,776,000	1956	104,830,000
1897	3,650	1927	21,307,000	1957	106,616,000
1898	5,475	1928	21,461,000	1958	109,584,000
1899	5,560	1929	19,314,000	1959	125,968,000
1900	5,450	1930	17,868,000	1960	133,910,000
1901	5,400	1931	14,834,000	1961	141,937,000
1902	6,253	1932	13,418,000	1962	135,847,000
1903	8,960	1933	11,227,000	1963	144,407,000
1904	11,542	1934	12,556,000	1964	138,752,000
1905	8,454	1935	13,755,000	1965	138,314,000
1906	7,000	1936	14,582,000	1966	134,470,000
1907	9,339	1937	19,166,000	1967	136,310,000
1908	17,775	1938	19,022,000	1968	144,250,000
1909	22,137	1939	21,454,000	1969	154,945,000
1910	115,430	1940	25,711,000	1970	155,743,349
1911	186,695	1941	29,878,000	1971	146,261,295
1912	1,572,306	1942	32,812,000	1972	137,564,566
1913	2,406,522	1943	34,253,000	1973	139,054,568
1914	3,560,375	1944	33,356,000	1974	138,735,974
1915	4,245,525	1945	36,219,000	1975	132,237,026
1916	6,234,137	1946	38,977,000	1976	134,148,510
1917	8,978,680	1947	44,772,000	1977	135,994,695
1918	12,596,287	1948	55,032,000	1978	137,384,886
1919	13,172,000	1949	47,890,000	1979	126,669,861
1920	16,831,000	1950	61,631,000	1980	126,361,962*
1921	19,333,000	1951	68,929,000	1981	122,173,818*
1922	26,715,000	1952	68,074,000	1982	118,715,785*
1923	44,785,000	1953	82,618,000	1983	120,979,721*
				Cumulative Total	5,050,602,670

Sources: Bureau of Mines (1894-1969).
Wyoming Department of Revenue and Taxation.
*Wyoming Oil and Gas Conservation Commission.

well, and discovered oil at 800 feet. Although the strike was modest, the discovery spurred many other companies to secure oil leases in the area.

Although the Bighorn Basin was initially opened up by wildcatters, most lacked the capital resources necessary for significant development of the resource. Thus, much of the large-scale development was accomplished by major companies, such as Midwest Refining Company and Ohio Oil Company.

A number of large fields were discovered in the Bighorn Basin during the early 1900s, including the Garland (1906), Oregon Basin (1912), Grass Creek (1914), Little Buffalo Basin (1914), and Elk Basin (1915) fields. Oil was produced mainly from structural traps or classic "sheepherder anticlines." Late in the summer of 1913, the first exploration of the Grass Creek field was accomplished. Since only light portable rigs were used in the exploration, no holes were drilled deep enough to strike the productive sands. The exploration efforts did attract local attention, however, and in 1914, several groups brought in additional drilling outfits. Oil in the Grass Creek field was first discovered by the W.L. Valentine interests in June 1914 at well #1, on the Washakie #11 tract. Additional wells were drilled during the summer and fall, and by January 1, 1915, a total of 23 wells--14 oil, seven water, and two unfinished--had been drilled in the field.

Since no facilities for shipping oil existed at the Grass Creek field, the wells were initially capped. Then in June 1915, a 6-inch pipeline from Grass Creek to Chatham (access point on the Chicago, Burlington & Quincy Railroad) was completed. Rapid development on the patented lands south of Grass Creek continued throughout 1915, although exploration efforts were hampered by the withdrawal from entry of unpatented lands north of the Grass Creek area.

The Oregon Basin is the largest depression on the west side of the Bighorn Basin, approximately six miles wide and 11 miles long. It is unlike most other basins in the region in that it is less regular in shape than most and presents many diverse surface forms. The south dome of the Oregon Basin was the first area to be explored. A shallow well was drilled in early 1912, but the first deep exploration was the McMahan well, drilled during July and August of 1912. In the north dome area, the first deep well was the Pauline well.

Late in 1942, the Minnelusa Corporation drilled a deeper test well in the Elk Basin field and established an initial flow of 2,500 barrels of oil per day in the Embar Tensleep Formation. By 1944, Tensleep production was established in other Bighorn Basin fields as well. Elk Basin was the second largest oil field in the Rocky Mountain region at the time, topped only by the Salt Creek field.

In 1955, Wyoming oil production approached 100 million barrels of oil. Several Bighorn Basin fields were among the list of the 28 fields producing more than 1 million barrels per year. First among Bighorn Basin producers was the Elk Basin field, with 6.8 million barrels, followed by the Oregon Basin field, with 5.8 million barrels.

As early as 1926, pioneer secondary recovery efforts were already being applied in the Elk Basin field. Daily production was increased by 250 barrels of oil per day by injection of gas into the Frontier reservoir. These early recovery efforts not only increased oil production, but also put to use natural gas that otherwise would have been flared. Today, the Bighorn Basin fields are sites of many secondary and tertiary recovery projects, including such techniques as infill drilling, expanded waterfloods, and polymer flooding.

Interest in secondary and tertiary recovery continues in the Bighorn Basin. During 1983, for example, Amoco Production reportedly spent $22.6 million on secondary recovery projects and anticipated spending an additional $22.3 million during 1984. Exploration activities also were on the increase. Two factors influencing the renewed activity in the area included poor economic conditions in the Williston Basin and tightly held acreages in the Powder River Basin.

Plans for new exploration included areas in the Shoshone National Forest. On June 13, the U.S. Forest Service began taking applications for seismic work, thus ending a moritorium that had lasted nearly a year. The moritorium resulted from a lawsuit filed by the Foundation for North American Wild Sheep, a Cody-based hunting and guiding organization. With the lifting of the moritorium, Marathon Oil announced plans to drill a 5,600-foot, $1.5 million well 28 miles west of Cody between Pagoda and Grace creeks.

POWDER RIVER BASIN DEVELOPMENT

Much of northeastern Wyoming lies with the broad structural basin area known as the Powder River Basin. Distinct boundaries exist only to the west, where the basin is confined by the Big Horn Mountains, and to the northwest, where a range of hills separates the Powder River Basin from the Tongue River Basin. In total, the Powder River Basin stretches over a 25,000-square-mile area.

Knowledge of oil in the Powder River Basin predates statehood. Numerous oil seeps were known to exist at the margins of the basin during territorial days. Indians used the heavy oil seeping from such natural springs for medicinal purposes, while early settlers used the oil for fuel, lubricants, road dressings, and as an insecticide that was painted on fruit trees and hen houses.

Springs in the Moorcroft area supplied oil to Black Hills gold mining operations as early as the mid-1800s. The dark green, paraffin-base oil proved to be an excellent lubricant and sold for $28.00 per barrel in Deadwood, South Dakota. By 1887, some 60 wells had been drilled in the Moorcroft anticline, some to depths of 1,600 feet, resulting in the first oil field in the Powder River Basin.

The development of the Salt Creek field, located 40 miles north of Casper, established Wyoming as the oil capital of the Rockies and transformed Casper into a major oil center. As in other areas, oil seeps had been discovered in the Salt Creek field as early as the mid-1800s, but it wasn't until 1883 that the first claims

were filed. Stephen Downey, a Laramie lawyer, attempted to acquire rights to land in the area under the placer mining laws, staking his claim near a natural oil spring. In 1884, Downey's claim was jumped by Territorial Geologist Samuel Aughey as a result of Downey's failure to record a deed or to conduct proper assessment work. In all likelihood, Aughey was the first man to recognize the true oil-bearing properties of the Salt Creek anticlinal structures.

By the late 1880s, interest in the Salt Creek field was increasing. Prospectors and claim stakers infiltrated the area. Most, however, lacked the investment capital necessary to develop their claims. Successful completion of the first well thus was not achieved until 1889 when a well was drilled by Phillip "Mark" Shannon, a successful oil man from Pennsylvania. Oil was discovered at a depth of 1,000 feet and was hauled in wooden tank wagons by eighteen-horse teams to Casper.

In 1895, Shannon built a small refinery at the Center Street crossing of the Chicago & North Western Railroad. The refinery produced a variety of products, ranging from light cylinder oil to axle grease.

Despite a favorable geologic report of the Salt Creek field issued by University of Wyoming geologist Wilbur Knight in 1893, little development in the Salt Creek field occurred until the beginning of the twentieth century. Earlier development was hampered by poor market conditions and lack of adequate transportation facilities.

Despite many difficulties and legal entanglements concerning insecure claims, development of the Salt Creek field proceeded throughout the early 1900s. In 1908, the first Salt Creek field gusher came in. The well was drilled by "Daddy" Stock for the Dutch Oil Company, one of the many foreign companies active in the field. In 1914, the Midwest Oil Company, which had built storage tanks, a refinery, and pipelines for Salt Creek oil, merged with the Franco-Wyoming Company, thus becoming one of the dominant concerns in the field.

A year earlier, Standard Oil of Indiana had become the first major oil company to enter the area, when it built a "cracking" plant in Casper. The refinery used residue oil from other refineries to produce gasoline for use in the increasingly popular automobile. By 1921, Standard Oil and Midwest Oil had merged into one company. With the Standard Oil link, outlets for Salt Creek oil products thus were opened in eastern markets.

Production in the Salt Creek field quickened dramatically in 1917 with the discovery of the Second Wall Creek Formation. By 1923, at the height of its development, the Salt Creek field became a virtual forest of oil derricks, producing in one calendar year one-fifth of the total crude oil output of the United States.

The Teapot Dome area of the Salt Creek field was the focus of a major scandal during the 1920s. In 1922, the Teapot Dome lease was arbitrarily awarded to the Mammoth Oil Company. Legislative investigations, civil suits, and criminal proceeding followed. In 1928, Interior Secretary Albert B. Fall was tried for bribery and conspiracy, fined $100,000, and sentenced to a year in prison.

As the Salt Creek field was being developed, oil companies were also active elsewhere in the Powder River Basin. The Big Muddy field near Glenrock was discovered in 1916. In Niobrara County, the Ohio Oil Company drilled the discovery well for the Lance Creek field in 1918.

Except for new discoveries in the Lance Creek and Cole Creek fields made during the mid-1930s, new exploration activities in the Powder River Basin dwindled until World War II, hampered by poor transportation facilities and poor market conditions. The economic resurgence experienced during the 1940s and 1950s, however, also brought new exploration and significant new discoveries. Among the new finds were the Fiddler Creek, South Glenrock, Clareton, Donkey Creek, and Dead Horse Creek fields.

Another major upsurge in Powder River Basin oil activity occurred in the late 1960s and 1970s, with the discovery and development of large stratigraphic oil traps in the region. The discovery of the giant Hilight field contributed to a historic state production high in 1970. Exploration of the interior basin area led to discovery of the Hartzog Draw field in 1975.

During the past decade, a large portion of all development activitiy in Wyoming has occurred in the Powder River Basin. The Salt Creek field remains an area of active interest. Since it began production, the Salt Creek field has produced 598,757,986 barrels of oil and ranks among the top producing fields in the United States. With 1,233 producing wells, it currently ranks second among producing fields in the state, with an annual output of approximately 5.5 million barrels.

Significant discoveries in the Powder River Basin during 1983 stimulated drilling activity during the latter part of that year. A discovery made by the Louisiana Land & Exploration Company in southern Campbell County initially produced 2,360 barrels per day from the Cretaceous Dakota Formation to establish the Mexican Springs field. Additional wells by LL&E and Diamond Shamrock have confirmed the field, and additional drilling is underway.

The development of the Amos Draw and Felix fields in 1983, and the subsequent discovery and development of the Andy, Sapphire, and Elk Draw fields in western Campbell and eastern Johnson counties, opened a large new production area in the Muddy Formation. Davis Oil discovered four of the new fields, and Aminoil USA, Inc. is credited with discovery of the Elk Draw field. Current data suggest that the five fields may be linked, forming one large reservoir. At least 60 wells have been drilled in the Amos Draw area, with another 30 to 40 possible.

In addition to exploration and development work in the Dakota and Muddy-producing zones, operators have been active in and near existing fields throughout the Powder River Basin. The Powder River Basin likely will again be the most active area in the state during 1985. Davis Oil, for instance, is expected to continue development in or near the Amos Draw field. In addition, more evaluation can be expected in Converse County, where Louisiana Land &

Table 2: Wyoming's Twenty Largest Crude Oil Fields (based on 1983 production)

Field	County	Year Discovered	1983 Production (bbls.)	Cummulative Production (bbls.)
Oregon Basin	Park	1912	9,719,754	341,312,098
Painter Reservoir	Uinta	1977	7,418,532	22,269,399
Salt Creek	Natrona	1889	5,957,982	598,757,986
Little Buffalo Basin	Park-Hot Springs	1914	4,312,013	101,444,882
Brady	Sweetwater	1973	3,533,340	39,825,731
Elk Basin	Park	1915	3,521,485	416,780,497
Hamilton Dome	Hot Springs	1918	3,371,101	214,736,942
Lost Soldier	Sweetwater	1916	3,221,451	196,454,952
Garland	Big Horn-Park	1906	2,927,476	148,979,852
Grass Creek	Hot Springs	1914	2,758,596	172,615,251
Hartzog Draw	Campbell-Johnson	1976	2,628,873	37,773,900
Wertz	Carbon-Sweetwater	1921	2,128,657	85,632,115
Bryon	Big Horn	1918	2,085,887	112,153,224
Frannie	Park	1928	1,915,217	104,656,011
Winkleman	Fremont	1917	1,794,006	79,829,182
Scott	Converse	1979	1,495,721	5,962,383
Pine Tree	Campbell-Converse	1976	1,299,030	3,775,416
Ryckman Creek	Uinta	1976	1,287,570	11,341,369
Well Draw	Converse	1973	1,156,194	22,989,767
Teapot Dome (Naval Petroleum Reserve No. 3)	Natrona	1922	1,025,557	14,735,355

Total 1983 Production - Twenty Largest Fields: 63,558,522.

Percentage of total 1983 state oil production: 52.54 percent.

Source: Wyoming Oil and Gas Conservation Commission.

Exploration and Diamond Shamrock Oil & Gas have completed "barn burners" in the Dakota Formation. Another Dakota find in the Kitty field by Maxim Drilling has sparked further interest in the formation.

Amoco Production has projected 24 development wells in various areas of the basin, along with as many as 118 wells to expand secondary recovery projects at the Salt Creek and Hartzog Draw fields. Other companies expected to remain active in the Powder River Basin include Woods Petroleum, Amberex Corporation, Inexco, Hrubetz Oil Company, TXO Production, Lear Petroleum, and Milestone Petroleum.

OVERTHRUST BELT DEVELOPMENT

The Overthrust Belt is a strip of structurally disturbed strata that extends approximately 2,200 miles, from northern Alaska southward through Canada and the western United States, then into Mexico. The Overthrust Belt is a part of the vast system of mountain ranges and basins comprising the North America Cordillera.

The Idaho-Wyoming-Utah segment of the Overthrust Belt is the region which lies south of the Snake River Plain and north of the Uinta Mountains of northeastern Utah. It is believed to extend more than 100 miles in width from its eastern margin along the Green River Basin into or beyond the Basin and Range geologic province to the west. The western margin of the Thrust Belt is not precisely defined. Thrust features are found in an area encompassing more than 10,000 square miles, and extend more than 200 miles in length.

The existence of oil in southwestern Wyoming has been known since the early 1800s. W. Clayton published the first written account of oil in the region in his "Latter Day Saints Emigrants Guide" in 1848. In his account, Clayton described a "tar" or "oil spring" in the Sulphur Creek area near Fort Bridger. The oil from the spring was sold in small quantities to emigrants passing through the area on their way to Oregon and California.

Aspen (abandoned), Spring Valley, and Sulphur Creek fields in Uinta County were sites of early discoveries which resulted in drilling during the late 1800s and the early 1900s. While drilling a water well near a coal mine, the Union Pacific Railroad Company encountered oil in a sandstone unit at 491-493 feet, then again at 573-581 feet and at 1,148-1,170 feet. However, the small, shallow fields in the Spring Valley-Aspen-Sulphur Creek area never resulted in significant production and provided little impetus for further exploration.

The second wave of successful exploration occurred in the Big Piney-La Barge complex, which lies in a transition zone between the Green River Basin and the Overthrust Belt. This large producing area is located on a large anticlinal structure known as the La Barge

platform.

The La Barge field was discovered in 1924. In 1952, an intensive gas development was initiated by A.B. Belfer, founder of Belco Petroleum.

The Tip Top field was discovered in 1951, the Hogsback field in 1959, and the Dry Piney field in 1970. These three fields are located on the edge of the Overthrust Belt. To date, the three fields have resulted in production totaling 26.2 million barrels of oil. Such large discoveries on the margin of the Overthrust Belt stimulated interest in the Overthrust Belt proper.

Extensive exploration of the Overthrust Belt, however, did not begin until the discovery of Utah's Pineview field in 1975. Prior to that time, oil and gas exploration in the Utah portion of the Overthrust Belt was relatively minor. The first drilling in northern Utah's segment of the Overthrust Belt occurred in 1924 near the town of Coalville. Additional drilling occurred in the Cache Valley further north in Utah beginning in 1925. However, neither venture proved successul.

In 1949, a well was drilled near the Utah-Wyoming border on the Utah portion of the Yellow Creek anticline. It was deepened in 1952 into the Nugget Sandstone without shows. In 1976, Amoco drilled a higher position of the anticline in Wyoming and established gas and condensate production in the Twin Creek Limestone in what is now the Yellow Creek field.

With the discovery of the Yellow Creek field, activity in the Overthrust Belt intensified, and between 1976 and the present, a series of new discoveries were made in both Wyoming and Utah.

The Ryckman Creek field, located about 15 miles northeast of Evanston, was discovered in mid-1976. Additional discoveries in the Wyoming portion of the Overthrust Belt are the Whitney Canyon field, the Painter Reservoir field, and the Evanston field (now combined with the Yellow Creek field).

During 1983, 31 producing wells were located within the Ryckman Creek field. Cumulative production of the field was 11.3 million barrels of oil and 35.6 million mcf of gas. As of the same date, 20 producing wells were located in the Yellow Creek field. Cumulative production of the field was 1.6 million barrels of oil and 31.4 million mcf of gas.

In 1983, a considerable amount of activity was centered around the giant Anschutz Ranch East field. Amoco Production Company was the most active operator, both in terms of exploration and development. The company confirmed its 1982 Chicken Creek discovery, just north of the Anschutz Complex, and opened an apparent new producing area with its Sulphur Spring Unit test about six miles north of Glassock Hollow.

Overall, however, exploration work has been disappointing during the last two years. Some operators have suggested that another large discovery will be needed soon in order to maintain interest and activity at a high level.

Despite such concerns for new production, development will continue in or near existing fields. American Quasar Petroleum will continue development work at the Pineview field in Utah. In addition, Chevron USA, Gulf Oil, Champlin Petroleum, Sohio Petroleum Company, Exxon, Arco Oil & Gas, Conoco Inc., and others have broad interests in both Uinta and Lincoln counties. Additional development is also likely in or near the Whitney Canyon-Carter Creek complex, although current gas market conditions offer little incentive for such new development at the present time.

WIND RIVER BASIN DEVELOPMENT

The Wind River Basin is located in west-central Wyoming. Its western boundary is defined by the mountain summits along the Continental Divide in the Wind River Range. It is bordered on the northwest by the Absaroka Range; to the north by the Owl Creek Mountains; and to the south by the Granite Mountains, the Antelope Hills, and the Rattlesnake Hills.

The first oil well drilled west of Pennsylvania was drilled in the Wind River Basin. In 1884, Mike Murphy, a promoter and civic leader in Fremont County, drilled three wells in the area known as Derby Dome, or Dallas Dome, southeast of Lander. The Murphy #3 well reached a depth of 300 feet and produced oil at a rate of up to 500 barrels per day. Witnesses reported that pressure from the well sent a "fine spray of crude 70 feet into the air and caused a gentle black rain to fall on the surrounding terrain." This field, which marked the first commercial production of oil in Wyoming, is still in production today. In 1983, 122,370 barrels of oil were produced, bringing total cumulative production in the field to 10,136,016 barrels.

Most of the producing fields in the Wind River Basin are relatively small, and many are located within the boundaries of the Wind River Indian reservation.

The Dubois field, located north of Dubois, was discovered in 1946. In 1983, five wells were producing in the field, with a total production of 6,842 barrels. The Circle field, located northwest of Fort Washakie, was discovered in 1923, but was shut-in until 1941. During the ensuing 10-year period, however, 24 wells were put into production. By 1983, a total of 135 producing wells were located in the field, with total production of 675,734 barrels.

The Maverick Springs field, located northeast of Fort Washakie, was discovered in 1917. In 1983, it included 81 producing wells, with production of 434,964 barrels. The Maverick Springs-Southeast field was discovered in 1967. In 1983, the field had only five producing wells, with total production of 5,850 barrels.

Gas was discovered in the Sheldon Dome

field located southwest of Maverick Springs, in 1925, while oil was not discovered until 1945. Other producing fields in the area are the Sheldon Northwest field and the Sheldon Dome South field. In 1983, the largest producing field was the Sheldon Dome field, with total production of 86,333 barrels. A fourth field, the Sheldon Dome West field, was discovered in 1968, but has since been abandoned after producing a cumulative total of 13,142 barrels.

The Steamboat Butte field is located north of Fort Washakie and was discovered in 1943. Total cumulative production was 81,994,440 through 1983. The discovery well for the Pilot Butte field was drilled in 1916. In 1983, 19 wells produced in the field, with production of 119,860 barrels.

Drilling was first conducted in the Winkleman field as early as 1917 without results. Later efforts, however, proved more successful. In 1983, 96 wells were producing, with total production of 1,794,086 barrels.

Oil was discovered in the Sage Creek Anticline field in 1947, with the first production in 1951. In the Plunkett field, the second field to be discovered in the basin, a well was drilled in an oil seep in 1909. Subsequently, some 25 wells were drilled. Before the field was abandoned, cumulative production totaled 37,320 barrels.

The Lander field, sometimes referred to as the Hudson-Lander field, was discovered in 1909, but the first large producing well was not drilled until 1912. In 1983, a total of 83 wells produced in the field, with total production of 470,541 barrels.

Other fields in the Fremont county portion of the Wind River Basin which primarily produce oil include the Riverton Dome, Big Sandy Draw, Kirby Draw, Reservoir Creek, Campbell Ridge, and Popo Agie fields.

In 1983, oil production accounted for 42.78 percent of Fremont County's minerals valuation. Taxable production declined by 12,592 barrels in 1983, while at the same time a unit valuation decrease of $2.51 per barrel resulted in a valuation drop of $13,782,163. However, the Department of Economic Planning and Development (DEPAD) predicts that valuation should rebound in the near future.

Some producing oil fields also are located in the Natrona County portions of the Wind River

Table 3: Wyoming Taxable Oil Production and Valuation by County

	1980		1981		1982		1983	
	HBPD	H$	HBPD	H$	HBPD	H$	HBPD	H$
Albany	1546	34730	1554	53543	1436	42757	1421	38505
Bighorn	57362	944173	53136	1592206	52656	1426822	48856	1204985
Campbell	213338	4343381	202284	6655513	202216	6157725	210203	5887207
Carbon	21480	496959	32340	1117121	28463	895446	22760	656426
Converse	70955	2002998	65887	2340607	62829	2040765	56569	1683275
Crook	27378	592775	26497	846312	29444	814700	31812	814390
Fremont	64435	1124869	61657	1927342	56182	1601262	56308	1463441
Goshen	23	885	14	515	141	4416	153	4550
Hot Springs	90342	2072460	91499	2785893	85146	2335667	79318	1968150
Johnson	31078	681637	26671	898134	24005	735743	26038	733721
Laramie	2307	59359	2342	83713	2791	90425	3671	113141
Lincoln	2288	61242	2366	75744	2400	72113	3871	89728
Natrona	69760	1109950	68978	2345712	68069	2146186	71156	2972415
Niobrara	14067	409389	13844	483101	12342	397052	11658	342437
Park	246981	4374768	226421	6669338	219758	5860493	213710	5169368
Platte	--	--	--	--	--	--	--	
Sheridan	2052	31347	1695	58732	2310	72798	1839	53809
Sublette	18020	376733	17520	608075	15936	509653	15530	461599
Sweetwater	99835	1799346	92705	3179440	87377	2747238	88201	2543969
Teton	--	--	--	--	--	--	--	
Uinta	67356	1498754	84253	2775340	79341	2408909	113808	3220911
Washakie	22430	530376	23445	741935	20579	583739	18712	481627
Weston	18401	650813	24017	862645	27134	879977	28526	860536
Totals	1141435	23196946	1119126	36100962	1080555	31823885	1104210	29864189

Source: Department of Revenue and Taxation, Ad Valorem Tax Division.

Basin. The Roderville field, located in west-central Natrona County, was discovered in 1955. In 1983, a total of 11 wells produced 24,823 barrels of oil from the field. The Grieve field, discovered in 1954, and the Grieve North field, discovered in 1974, had produced a cumulative total of 32,148,987 barrels through 1983. In 1983, the largest producing field in the Natrona County portion of the Wind River Basin was the Poison Spider West field, with total production of 337,051 barrels from 22 wells. Other fields with production in 1983 included the Burnt Wagon, Poison Spring Creek, Government Bridge, Tipps, and Schrader Flats fields.

Exploration activity in the Wind River Basin has been generally slow in recent years. Industry observers cite lease problems on the Wind River Indian Reservation as one major impediment. Activity largely has been in or near existing fields, although a few wildcat tests have been conducted. Activity levels are expected to remain much the same in the near-term.

GREATER GREEN RIVER BASIN DEVELOPMENT

The Greater Green River Basin is located in west-central Wyoming and encompasses an area which includes all or portions of Carbon, Sweetwater, Lincoln, Sublette, and Uinta counties. Soon after the county was organized in 1921, oil was discovered in Sublette County near Big Piney. Preliminary production began in 1924-1925, with a combined total production for the two years of 6,859 barrels. The oil industry continued to grow in the LaBarge-Big Piney area, reaching annual production of 751,760 barrels in 1942.

In 1949, Superior Oil Company's Pacific Creek test broke the world drilling depth record, going to 20,521 feet. The test was described as "the hole that almost went to hell." The hole remained the deepest in the world for several years, and the deepest hole in the Rocky Mountain region for nearly a quarter of a century.

Production in the LaBarge-Big Piney area declined for several years after 1942, but then rose again, reaching 734,752 barrels in 1958 and 1,665,775 in 1961. Additional discoveries increased production even further, reaching a peak of 3.8 million taxable barrels in 1969, with an assessed valuation of $11,853,915.

In 1975, DEPAD predicted that Sublette County oil production could reach 4 million barrels per year by 1980. However, such was not the case. Between 1973 and 1983, oil production declined sharply, from 3.4 million barrels in 1973 to 1.6 million barrels in 1983, a drop of 53.69 percent. Expected new discoveries in the southern and western portions of the county failed to materialize. In addition, a sizeable portion of Sublette County's oil production results from stripping in association with natural gas production. DEPAD currently expects Sublette County oil production to remain at about 1.7 million barrels per year through 1988.

Significant oil production began in Sweetwater County with discovery of the Lost Soldier field in 1916. In 1983, the Lost Soldier field was one of the top producing fields in Wyoming. Ninety-two wells produced 3.2 million barrels of oil in 1983. Total cumulative production of the field was 196.5 million barrels.

The Wertz field, in both Carbon and Sweetwater counties, was discovered in 1936 by the Sinclair Wyoming Oil Company. Like the Lost Soldier field, the Wertz field is also a top Wyoming producer. In 1983, 43 wells produced 2.1 million barrels of oil, bringing the field's total cumulative production to 85.6 million barrels.

During the 1940s, work concentrated on field extensions and deeper drilling in the Lost Soldier and Wertz fields, with no new discoveries in the area. During the 1950s, however, several new fields were discovered in the region, the most important being the Desert Springs (1958), Desert Springs West (1959), and Patrick Draw (1959) fields.

One of the most active plays in the Rocky Mountain region during 1960 was the Patrick Draw-Desert Creek area. Early in 1960, El Paso Natural Gas Company announced two new producers in the Patrick Draw area, one which flowed at 1,135 barrels of oil per day. By September of 1960, 55 wells flowed in the area, with only five dry holes. Production from the wells ranged from approximately 300 to 1,200 barrels per day. In 1983, annual production from the Patrick Draw field was 524,060 barrels, bringing cumulative production to 77.4 million barrels.

In 1969, one of the largest lease acquisitions in history had a significant impact upon state oil production, when the Union Pacific Railroad agreed to lease 7.5 million acres of land to Pan American Petroleum Corporation. The lease extended through known oil and gas provinces in both the Denver and the Greater Green River basins. A number of discoveries resulted, including the Brady field in southern Sweetwater County in 1973. New production from the Brady field helped reverse a general decline in Sweetwater County oil production that had been occurring during the previous 15 years. In 1983, 25 wells in the Brady field produced 3.5 million barrels of oil, bringing total cumulative production to 39.8 million barrels. DEPAD is currently predicting that Sweetwater County's annual oil production will remain at about 9 million barrels through 1987, before increasing slightly in 1988.

In 1983, drilling activity was at a low ebb in the Greater Green River Basin. Some work was centered in the Moxa Arch area, and in the Lost Soldier and Wertz fields. In the LaBarge area of Sublette County, work continued in and around several existing fields. A Wexpro Company well in the Dry Piney Unit recently was recompleted to a flow of 640 barrels per day.

Exploration and development work is

expected to continue at a fair pace in the Moxa Arch and Butcher Knife Springs areas. Activity in other areas of the Greater Green River Basin, however, will probably remain light (including the Red Desert and Wamsutter areas).

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Industry Interview

"So Goes Oil, So Goes Wyoming"

(The following is excerpted from an interview with Rick Robitaille, executive director of the Petroleum Association of Wyoming. The interview, which was conducted in November, highlights some of the challenges faced by the Wyoming oil industry. Minor editing is included for the sake of clarity.)

WQU: What is the current situation with respect to state oil production? Where are we going in terms of growth?

Robitaille: There are so many factors affecting the industry that it's extremely difficult to offer any kind of predictions. We have problems that are worldwide which affect us in Wyoming, the law of supply and demand and the threat of declining prices. We do not expect any drastic changes one way or another in the next few years, barring anything unforeseen from the Middle East or the world market, or in taxation policies. The same is true for production as it is for exploration.

WQU: What's the current price?

Robitaille: Prices vary depending upon the grades of the crude. From the information we have been able to obtain, prices range somewhere between $26.50 and $29.50.

WQU: Do you think it will hold steady? Do you see any further declines?

Robitaille: Well, there again we must go back to the world situation. The Saudis are posting a price and OPEC is posting a price, but it really is not an accurate statement of value. They're all discounting as much as $2.00-$2.50 a barrel. So they're down to $26.50 or $27.00 for some pretty high grade crude oil. We have seen downward pressures on the market but we hope that will stabilize.

However, the price can change overnight. It is very, very difficult to predict. There have been all kinds of prognostications. We believe that right now, there are probably more factors affecting an additional move downward than those that would stabilize or increase the price. We may see additional decreases. However, we don't expect them to be large.

WQU: Alot has been said about enhanced oil recovery. Some studies suggest that the cost of oil would have to exceed $30 per barrel for those projects to be economical. Does that sound correct?

Robitaille: Enhanced oil recovery, first of all, has a tremendous future in Wyoming. Secondly, it is dependent primarily on economics, and those economics will change with each and every field, depending on the amount of equipment, the number of additional wells that need to be drilled, and the expense of recovering the remaining reserve. Generally, enhanced recovery has been considered a pretty expensive business, and as a result has required higher prices. So, I would have to say a higher price is needed to increase and encourage enhanced recovery operations. You can improve the economics a couple of ways: improve the price or lower the tax.

There are too many variables just to say there has to be a specific price. However, one must remember that operators are not putting up

the money to explore for new reserves. We know they're there. We are putting up the money to figure out how to get them out. That gets back to technique. Do you need to drill additional wells? Is the CO_2 accessible in the western part of the state? Obviously, every time the price drops it hurts the economics of these projects. We're attempting to do everything we can to keep the projects feasible. But the bottom line on oil and gas is economics.

WQU: You said the potential for enhanced oil recovery is great. How much of the original oil in place can be recovered?

Robitaille: That, too, will vary with the fields because of the sands, the permeability, the porosity of the subsurface strata. Generally, a good rule of thumb is through primary and secondary production, we can recover between 20 percent and 40 percent of what's there, which tells us 60 percent to 80 percent of what was discovered is still in the ground. If we could get another 5 percent to 10 percent out, then we have the capability of producing additional volumes in the 100s of millions of barrels. We have the opportunity of virtually doubling proved reserves. We have seen figures everywhere from an additional 10 billion to 20 billion barrels of oil available in Wyoming to recover by ultimate recovery means. Again, we are not dealing with a true science. To just have a blanket statement that says we can recover so much is impossible.

WQU: Would enhanced recovery ultimately reverse, or simply slow, recent production declines in the state?

Robitaille: We will try to do two things. First, we will try to increase production. Then, we will try to stabilize it. Over the long-run, we believe enhanced recovery will stabilize production, with a potential to stabilize production well into the twenty-first century. Keep in mind that we are going to discover new fields at the same time. So with the combination of existing production, new discoveries, and increased recovery from enhanced projects, we are certainly optimistic about holding production levels plus or minus a few percent from where it is now well into the future.

WQU: Are there more Overthrust Belts in this state? Are there places with that kind of potential? Are they being explored?

Robitaille: Sure. Some of them are being explored, some are not. Actually, there is alot of area in this state that remains somewhat unexplored. I qualify that to some extent because we have had some drilling in virtually every county of the state. Now we are drilling to greater depths as a result of new technology and better equipment. But there are a number of areas that are off limits. That is one of the most severe problems we face. We can take the world market, and federal, local and state taxation, and we can plug those into our economic indicators to determine whether exploration is viable or not. But we can't do anything if we don't have the available land to drill.

In Wyoming, for example, we have the wilderness bill that just passed, withdrawing another million or so acres from drilling. That was just the Forest Service. The BLM is going through a wilderness review, and we have no doubt they will withdraw another several hundred thousand or possibly a million acres. In addition, millions of acres are being withdrawn by stipulation of the surface management agencies. In many cases, we are dealing with public lands. But we also have seen cases where the federal government is now claiming jurisdiction over private lands adjoining them. We're seeing restrictions like you can't drill so far from this or so near to that. We can't drill during this time of the year. We must suspend operations when the eagles fly over. There are numerous leases that specifically have no surface occupancy clauses. We can do marvelous things in this industry. We can use helicopters to get rigs into certain places. When conditions are right, we can do some directional drilling. But we have never been able to drill without occupying the surface. So, when they say you are not going to occupy the surface, the lease is virtually worthless.

WQU: You're not suggesting anyplace somebody wants to drill, you should build a road, or blast out a tunnel through the mountains...

Robitaille: Quite the contrary.

WQU: On the other hand, some would rather you do nothing. So what's the solution?

Robitaille: There has to be a balance. We are the first to admit that there are areas in this country that are truly unique. They should not be disturbed, with the possible exception of a dire national emergency. However, we also believe those areas that can be reached, which have the potential, and that can be reclaimed, should be opened up for exploration.

There are two values to every piece of land. There is a surface value and subsurface value. If they are public lands, or federal lands, they must be managed to the maximum benefit of the people who own them--the people of the United States. When we're talking about an area that is being restricted for one reason or another, we're talking about a very limited use. If you look at the percentage of the population that would ever set foot into some of these areas or ever see the area, it's minute. On the other hand, everyone uses petroleum daily. You've got to look for balance in land management decisions.

WQU: How do you come to such a balance? Hold meetings?

Robitaille: You can hold all the meetings you want. The problem is lack of understanding, lack of awareness, over-protection. Reasonable people must sit down and look at all aspects and react as reasonable people. Not react emotionally, but react factually, based on evidence and opportunities, current experiences and new technologies, and make decisions from that point. It's extremely difficult. Most cases, when you're talking about drilling, you

are drilling based on facts. We want to drill here, we want to drill to this depth, we need to disturb this much area. Then, we are countered with emotion. Very seldom will you ever overcome emotion, particularly when it comes to the environment, with facts or reason or logic. We have to become more aware of that. The public needs to become more aware of the problem.

WQU: Do you think the people of Wyoming understand the contribution oil makes to the tax base of this state?

Robitaille: They have a much higher awareness of it than we originally suspected. But you don't hear from those folks. Our research indicates people in Wyoming have a very favorable impression of the industry. Yet, we are still encountering a number of roadblocks. These are not just emotional flings in the newspaper. Some roadblocks are set up by Congress, in the form of restrictive legislation. The federal lands in Wyoming are critical to the energy industry. While the federal government owns roughly 50 percent of the surface, they control approximately two-thirds of the minerals. Virtually everything Congress does has some type of repercussion on the oil and gas industry, when it involves occupying the surface or producing the minerals they own.

The public in general has completely forgotten the 1973 Oil Embargo. We are currently importing a third of our petroleum products. We need access to the lands. We need orderly development, as opposed to an emergency situation. If the U.S. gets into an emergency situation, you are going to see these lands entered at the direction of Congress regardless of costs, a rush to produce the minerals. That's hasty development. Nobody wants to see that as opposed to steady, progressive growth that can be sustained and can be accompanied by adequate planning and reclamation.

WQU: Is the regulatory environment any less restrictive on state lands?

Robitaille: The regulatory environment as far as access to state lands is not as restrictive because they don't control that much acreage. So actual control through regulations has not been that much of a roadblock when compared to federal lands. What we are seeing is other mechanisms that deter or discourage development. We have one of the highest combined tax rates on petroleum. It is very expensive to do business in Wyoming. Considering winter drilling and the depths in some of these remote areas, it is expensive. We begin to ask ourselves questions with regulations and expenses involved. If we are going to drill a well, should we drill it in Wyoming or would we drill it someplace else? If we can get it done cheaper someplace else, we may go someplace else.

On the other hand, we have been pretty successful in Wyoming as far as discovering oil is concerned. Sometimes state agencies adopt standards that are more stringent than necessary. That is a negative factor. Also, the state lease right now is one of the most unattractive leases to have. It wasn't too long ago that the state reduced its lease term by half. They cut the primary term from 10 years to five. At the same time, they increased the royalty rate from 12½ percent to 16 2/3 percent. They also limited the overrides to 5 percent. They have taken quite a chunk out of a very important segment of the industry, which makes the state leases very unattractive. Out of the total lands in Wyoming, we are slowly narrowing them down by either laws or regulations or land management plans. Couple that with an uncertain tax climate which could be assisted by some incentives, but is not to date and one can see many problems.

WQU: What do you mean by that?

Robitaille: Sixty percent of the value of Wyoming is oil and gas. We have been drilling for oil for a hundred years, and we've produced a very sizeable portion. It's time for the state to look at the oil industry and decide whether it wants to maintain a partnership and encourage industry to come to Wyoming to drill, to create tertiary production, go after it, put in the millions of dollars necessary. One way to do that would be through a temporary tax break. Say okay, if you drill a well and make a discovery, we will give you 24 months of only half the severance tax to help you recoup some of your drilling costs.

The trade off is new discoveries, increased revenues, more taxes on production. The same holds true for tertiary. The state could give a tax break to help get started. We know it's expensive. A tax break for five or 10 years could help operators recoup some of their investment. The option on tertiary production is to walk away and leave it in the ground, or figure out a way to recover what's there. If the price is stable and it is marginal, then how do you promote it? You promote it through a tax break, some type of favorable treatment so that the people who are willing to put up the money are satisfied they can at least get their money back, and hopefully, make some money on their investment.

WQU: What taxes do you pay on a barrel of oil?

Robitaille: First, there is a royalty, which is a percentage and generally ranges from 12½ percent to 17 percent. Then there is the ad valorem tax, which is levied and collected in the county. We are subject to the same rate as every other piece of property in the county. However, minerals pay on 100 percent of value. On top of that, without any credits or without any offsets, we pay the state severance tax, which right now is 6 percent. Then, there is the Windfall Profit Tax. It varies by class and type of production--new production, old production, tertiary production. Uncle Sam did recognize the cost of tertiary production and gave it a lower rate. The feds saw the light on that one real quick. Then we pay income taxes, which vary. If you add it all up, you could pay as much as 60 percent to 70 percent of your oil income dollar in taxes and royalties.

It's a risky business and requires a lot of capital. Just because you actually find oil

doesn't mean it's going to pay off. Some wells produce eight barrels a day, some will produce 880. Unfortunately, it's not like sinking a straw into a river. Each well has its own characteristics. It would be nice for a state, which derives such a large percentage of its income from one single industry, to turn around after years and years of fighting over tax increases to say we appreciate the job you're doing and we want to help.

Look what's going on. Everybody is talking about economic diversification, economic development. Wyoming has certain recognizable limits to diversification. Transportation costs are really high. Expenses are high from a personal standpoint. We don't have alot of water available. The key is the minerals we have.

If we want economic development, we need to start with what we have and expand on that. The oil business, is not just drilling wells, it is hundreds of small businesses that came out of and related to it. The same thing will happen in tertiary recovery--business to handle the fluids, business to service and handle the equipment--those take facilities, equipment, and the personnel. We have some of the greatest mineral reserves there are. Use them. With that in mind, a case could easily be made to provide some incentives for the largest single business in the state.

WQU: If you are in a marginal situation because of the world oil price, if there is some tax incentive, that makes the difference?

Robitaille: Two or 3 percent on a tertiary project that is going to last 10 to 15 years could make the difference, and the decision whether to proceed or whether to hold. On a $30 barrel, 3 percent would be 90 cents. It's not going to be a net 90 cents, because there are going to be some other tax trade offs. Even if it comes out to be 60 cents per barrel, 60 cents a barrel could be very atrractive. It may make the difference in an economic decision, whether to proceed.

Keep in mind everytime we put a drilling rig to work we employ 25 to 30 people. Lose 100 of them and 3,000 people are out of work. I doubt if we'll ever get back to the drilling level of 1981 on any kind of sustained basis, but we can and do have room for improving rig operations now. With that, we have increased revenues, salaries, and property taxes. Houses start to sell. We have somewhere in the neighborhood of an $800 million payroll in this state. Where does it go? Right down to the corner drug store, the shoe store, the grocery store. If we can sustain that or improve that, then it will help the economy. That's putting the money where it does the most good. The state gets money off sales tax as does the cities and counties. Property taxes go up, property values increase. Education will be the largest benefactor. So it dominoes right through the whole economy. If we want economic recovery, it just makes good sense to start with the base of the pyramid and work to the top. The base of the pyramid in Wyoming is oil and gas. No two ways about it. So goes oil--so goes Wyoming.

S.T. Mast, IPR

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EOR Feasibility Governed by Economics

In the oil business, the discovery of oil marks only a kind of prelude to the larger, though less colorful, drama of coaxing the precious substance from the depths of the earth. Even then, the best of efforts are often only partly successful. Despite the most determined prodding, often only half the original oil in the ground can be recovered, given current technology.

In Wyoming, gone are the days when simple pumping and waterflooding techniques are sufficient at many sites. Most of Wyoming's largest fields are old, past the point in many cases where traditional techniques result in significant new production. Only the latest technologies often are capable of yielding additional barrels of crude, tertiary techniques collectively known as "enhanced oil recovery" (EOR).

EOR techniques include such things as steam drive recovery, in situ combustion, carbon dioxide flooding, surfactant flooding, and alkaline flooding. The key process efficiency measure of EOR is the volume or pounds of material injected into a field versus the additional barrels of oil recovered. If the cost of recovering additional barrels of crude exceeds the price such barrels will bring in the marketplace, EOR projects will be ruled impractical on economic grounds. Thus, economic considerations of EOR are matters of paramount importance.

The application of one EOR technique or another depends to a great extent on the geology of a particular site. Thus, while steam drive techniques might be applied in a California heavy oil reservoir characterized by its shallow depth, high permeability, and high porosity, such techniques may not be equally applicable to the complex subsurface structures of Wyoming's Overthrust Belt.

Even in locations where particular EOR techniques are applicable, recovery costs will vary. A review of process efficiencies by the World Petroleum Congress in 1983 at selected sites where various EOR techniques were employed indicated rather wide variance. The study found that steam drive sites reported the highest recovery efficiencies, 400 to 800 additional barrels per acre-foot, or between 30 percent and 60 percent of the remaining oil in place. In situ combustion sites produced an additional 100 to 250 barrels per acre-foot, or 15 percent to 25 percent of the remaining oil in place. Surfactant flooding followed, with 10 to 60 additional barrels per acre-foot, or 2 percent to 10 percent of the remaining oil in place, while alkaline flooding was last, producing an additional 20 to 40 barrels, or 2 percent to 5 percent of the remaining oil in place.

A key to cost, of course, is how much material was required to produce the additional oil. In the case of steam drive, 4-6 barrels of steam were required to produce an additional barrel of oil, for in situ combustion, 15-20 mcf of air were required to produce an additional barrel, for carbon dioxide flooding, 10-25 mcf of CO_2 were required to produce an additional barrel, for surfactant flooding, 20-40 pounds were required, and for alkaline flooding, 30-60 pounds were required to produce an additional barrel of oil.

A 1981 study conducted for the U.S. Department of Energy by Lewin & Associates, Washington, D.C., addressed the subject of EOR economics even more directly. The authors incorporated such considerations as investment costs, operating costs, financial costs, and capital costs in arriving at their conclusions.

As noted in the study, the greatest uncertainties in achieving economically successful EORs were in estimating incremental oil that could be recovered and the production rate, and in establishing the relationship between the injection of EOR substances and the additional production of oil. Thus, establishing the feasibility of a project relies both on empirical field data and on theoretical modeling.

For each EOR technology, the study examined sample reservoirs displaying favorable, average, and below average properties for EOR. The market price of oil was assumed to be $30 per barrel (used for cost components dependent upon selling price, such as Windfall Profit Tax, royalties, and severance taxes).

In the case of steam drive technology, three California heavy oil reservoirs were selected for study. The cost of producing a barrel of oil with steam drive techniques in the three reservoirs ranged from $27-$35 per barrel. The major cost components were steam costs ($12-$15) and taxes ($9). Among the three in situ combustion sites selected, the cost of producing a barrel of oil ranged from $25-$36 per barrel, assuming the burn front and other operating problems could be controlled. With respect to carbon dioxide flooding, costs ranged from $26 to $39 per barrel of oil produced. CO_2 costs accounted for $12-$16 of the total, while taxes accounted for $9-$10 of the total.

As with the other EOR techniques, three surfactant/polymer flooding sites were selected, based on variable parameters. In the case of surfactant flooding, costs ranged from $35-$46 per barrel of oil produced. In the case of polymer waterflooding, the costs ranged from $30-$46 per barrel of oil produced when such flooding was used in a tertiary mode and from $22-$28 per barrel of oil produced when it was used in a secondary mode (that is, undertaken when the field is waterflooded as part of secondary recovery operations).

One reason for the relatively high costs cited by the Lewin & Associates study is due to the assumptions used to produce the model. The model takes into account all major cost factors, as well as assuming that one new well per pattern would be drilled, new equipment would be purchased, and existing wells would be worked over for the application of EOR technology.

Based on the Lewin & Associates model, a study was recently conducted by Janak Varma, a University of Wyoming petroleum engineering graduate student, under the direction of R.E. Terry, associate professor of petroleum engineering and co-director of the UW Enhanced Oil Recovery Institute. Rather than focusing on unit costs of production, the UW study projected future state oil recovery that might result from EOR projects as a means of determining what levels of state income might be generated from EOR production.

Two surveys were conducted in relation to the UW study. First, past and current EOR projects in the state were examined. Second, EOR production figures for various fields were compiled. The production figures were then screened according to EOR process, and the Lewin & Associates model was applied. A ratio of production for each EOR process was multiplied by a recovery factor developed from the Lewin & Associates model, times the original oil in place, to arrive at a state EOR production figure. Projected over the next thirty years, the UW study concluded that 1.5 billion barrels of oil could be produced through EOR processes. Annual production could increase from 7 million barrels per year currently recovered through EOR processes to about 27 million barrels per year by 2015.

In calculating the amount of revenue that such production would produce for the state government in the form of taxes, the UW study developed a base case, plus a set of alternative cases based on varying costs of crude oil.

In the base case, the price of crude oil was fixed at $28.50 per barrel. Chemical costs were treated as operating costs; that is, such things as polymers and CO_2 were purchased on a yearly basis, rather than being purchased at the outset. The price of crude oil was assumed to escalate in price at 5 percent per year, the inflation rate was set at 5 percent per year, and a minimum rate of return was assumed to be 12 percent. Based on an average of payments from state, federal, and private lands, the tax return to the state was fixed at 16.4 percent.

Using the base case, over the next thirty years, the UW study concluded the state government would collect $1.3 billion through EOR recovery processes. Using alternative price scenarios, the amount that could be collected from production on EOR recovery ranged from $1.1 billion to $1.8 billion, the study concluded.

S.T. Mast, IPR

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ECONOMIC CHANGES

ECONONIC CHANGES

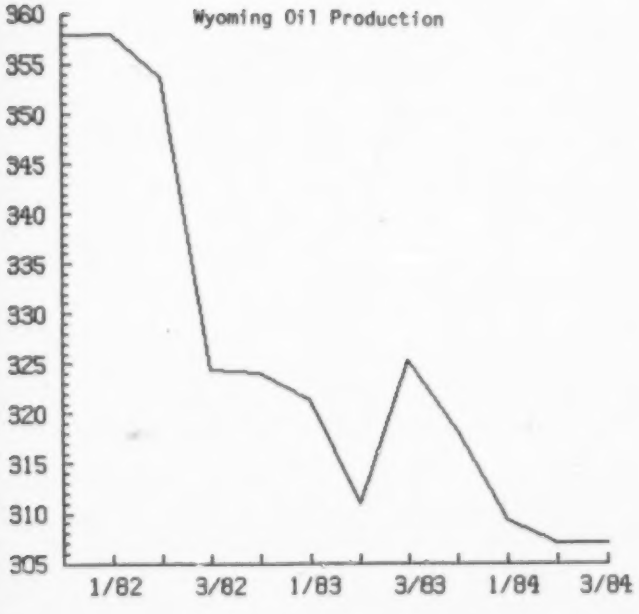
(Editor's note: The purpose of this section is to point out areas in the Wyoming economy in which noteworthy changes occurred, or in which existing trends were significantly accentuated, during the latest reporting period.)

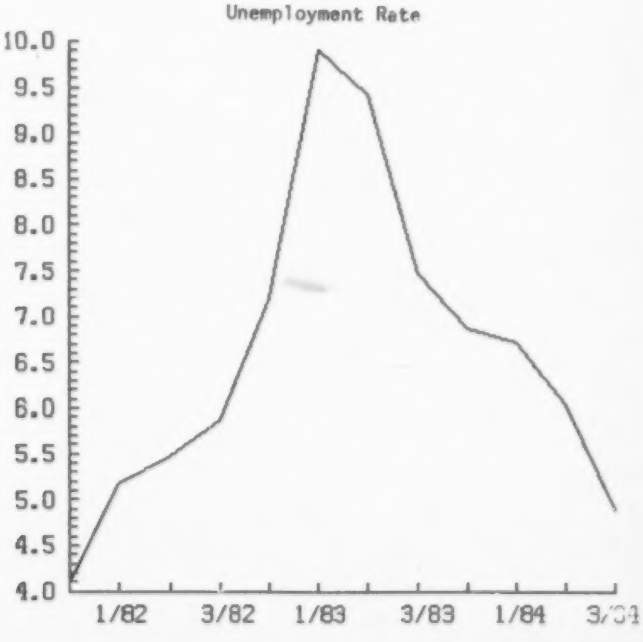
Recent developments in state oil production, labor force trends, and sales and use tax collections highlight the Update's third quarter 1984 statistics.

State oil production remained steady at 307,000 barrels per day during the third quarter, down significantly from the 325,000 barrels per day recorded during the third quarter of 1983. For the second quarter in a row, the figure marks the lowest production level recorded during the Update's 12-quarter reporting period.

With respect to labor force statistics, the state's unemployment rate continued to drop to 4.9 percent during the third quarter of 1984, down from the 6.0 percent rate recorded during the second quarter. During the same time, the number of unemployed persons dropped from 15,805 to 12,791. During the third quarter of 1983, 20,443 persons were unemployed. The number of employed persons also increased, from 245,871 during the second quarter to 248,480 during the third quarter. However, the figure was below the number registered during the third quarter of 1983, when 253,149 persons were employed.

Sales and use tax collections continued to improve. During the third quarter of 1984, collections totaled $57,132,000, compared to $51,151,000 during the second quarter and to $53,361,000 during the third quarter of 1983.





WYOMING DATA

Table 4: Agriculture[1]

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. Timber Cut in Wyoming National Forests (MBF)	33929.	11658.	4285.	23430.	26318.	14707.	5208.	35941.	47574.	21261.	7625.	48671.
Price Indices[2] (1967=100)												
2. Wyoming Crops, Prices Received-Latest	288.	260.	249.	245.	244.	247.	254.	280.	280.	275.	273.	262.
3. Wyoming Crops, Prices Received-Average	301.	275.	251.	239.	243.	246.	253.	268.	279.	275.	277.	261.
4. U.S. Crops, Prices Received-Latest	234.	232.	240.	239.	220.	234.	239.	260.	262.	271.	279.	265.
5. U.S. Crops, Prices Received-Average	232.	238.	240.	235.	221.	226.	244.	255.	260.	265.	275.	271.
6. Wyoming, All Commodities, Prices Received-Latest	239.	256.	256.	250.	225.	261.	246.	239.	245.	262.	246.	255.
7. Wyoming, All Commodities, Prices Received-Average	251.	248.	261.	246.	234.	249.	253.	233.	240.	255.	256.	249.
8. U.S., All Commodities, Prices Received-Latest	233.	244.	252.	248.	232.	245.	243.	248.	256.	266.	262.	254.
9. U.S., All Commodities, Prices Received-Average	236.	243.	251.	247.	234.	240.	247.	247.	250.	263.	264.	259.
10. Wyoming Livestock, Prices Received-Latest	224.	254.	258.	251.	219.	265.	244.	227.	235.	257.	238.	253.
11. Wyoming Livestock, Prices Received-Average	236.	239.	264.	248.	231.	249.	253.	223.	228.	248.	250.	246.
12. U.S. Livestock, Prices Received-Latest	233.	254.	262.	257.	243.	256.	247.	240.	252.	263.	248.	245.
13. U.S. Livestock, Prices Received-Average	240.	248.	261.	258.	245.	253.	251.	242.	242.	262.	255.	249.
14. Prices Paid by U.S. Farmers-Latest	304.	314.	317.	316.	315.	321.	324.	326.	326.	335.	335.	333.
15. Prices Paid by U.S. Farmers-Average	305.	313.	315.	317.	315.	320.	324.	325.	327.	333.	336.	334.

[1]First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.
[2]The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 5: Banking and Finance

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. Total Bank Loans and Leases Financing Receivables (T$)[1]	*****	*****	*****	*****	*****	*****	*****	*****	*****	2313197.	2359492.	2368731.
2. Total Bank Deposits (T$)	3278504.	3237333.	3322621.	3345619.	3587554.	3537206.	3669552.	3683748.	3789387.	3747828.	3812354.	3790977.
3. Total Non Interest-Bearing Deposits (T$)[1]	*****	*****	*****	*****	*****	*****	*****	*****	*****	657189.	734297.	723344.
4. Savings and Loan Mortgage Loans (T$)[2]	778334.	762153.	760622.	766593.	765708.	758938.	760041.	775159.	775795.	767125.	775396.	771560.
5. Savings and Loan Deposits (T$)	904212.	921642.	907758.	893087.	895889.	921290.	960250.	966113.	1006927.	1051271.	1087036.	1111213.
6. Prime Interest Rate[3]	15.8	16.2	16.2	13.5	11.8	10.5	10.5	11.0	11.0	11.5	13.0	12.75

[1]During the first quarter of 1984, the Wyoming State Bank Examiner began publishing it's quarterly report ("The Abstract Report of State and National Banks in Wyoming") in a slightly different format. IPR will therefore be altering the following banking and finance data series: total bank loans and total demand deposits. Beginning in the first quarter of 1984, data for total bank loans will include lease financing receivables; data for total bank demand deposits will be replaced by figures for noninterest-bearing deposits. For comparison, the reader can refer to past issues of the WQU.
[2]Only members of the Federal Home Loan Bank Board are included.
[3]Rate is for the last month of the quarter.

Sources: Series 1-3: Wyoming State Bank Examiner Quarterly Report.
Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published Monthly.

Table 6: Business Conditions

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. New Domestic Corporations	400.	389.	428.	403.	377.	348.	410.	366.	309.	359.	359.	332.
2. New Foreign Corporations	358.	357.	326.	285.	272.	240.	259.	331.	292.	260.	249.	259.
3. Total New Corporations	758.	746.	754.	688.	649.	588.	669.	697.	601.	619.	608.	591.
4. Business Failures	33.	31.	46.	54.	58.	47.	68.	52.	58.	59.	64.	67.
5. Value of Business Failures ($)	2987139.	2331991.	6842595.	-13034324.[1]	-6860186.[1]	6438421.	6400333.	535473.	-8163171.[1]	17789116.	14081414.	11774068.
6. Personal Bankruptcies	85.	96.	125.	123.	122.	140.	152.	172.	141.	180.	166.	169.

[1]Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.
Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 7: Construction

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. New Residential Dwelling Units	784.	851.	1050.	872.	689.	727.	1044.	1002.	729.	512.	1022.	755.
2. Value of Residential Dwellings Constructed (M$)	40.4	40.4	58.6	51.2	41.9	44.4	70.7	60.3	44.0	30.6	59.6	44.5
3. Value of Nonresidential Construction (M$)	57.6	25.2	59.8	63.1	35.2	37.9	54.4	48.2	54.2	11.0	28.6	26.9
4. Building Permits Issued in Selected Wyoming Cities	2516.	2317.	3353.	4295.	2803.	2762.	3586.	3701.	2138.	2025.	3892.	3546.
5. Value of Authorized Construction (T$)	53839.	49768.	62939.	101359.	34470.	37119.	46402.	68715.	51924.	29471.	42320.	36344.
6. Mortgage Interest Rate[1]	15.23	14.93	14.74	14.34	13.09	12.97	11.90	12.08	11.94	11.56	11.61	12.03

[1]Conventional first mortgage for new home purchase. U.S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Construction Potentials." Published monthly.
Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 8: Consumers

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. New Truck Registrations	3502.	4176.	3636.	3024.	3230.	3233.	3415.	3417.	4363.	3927.	4418.	4102.
2. New Car Registrations	3808.	4249.	4042.	3506.	3610.	3272.	3539.	3671.	3483.	3083.	3741.	3676.
3. Wyoming Personal Income (M$)	1474.	1476.	1524.	1477.	1512.	1429.	1518.	1607.	1589.	1594.	1713.	INA
4. US Disposable Income[1] (B$)	2110.	2132.	2157.	2196.	2238.	2261.	2303.	2367.	2429.	2502.	2554.	2605.
5. US Personal Income (M$)	632052.	620600.	636571.	639828.	660944.	653446.	668365.	683335.	714509.	720297.	737172.	INA
6. Latest US Consumer[2] Price Index (1967=100)	281.1	282.5	290.1	292.8	292.0	293.0	297.2	300.8	301.5	303.3	306.2	312.1
7. Quarter's Average US CPI	280.4	281.9	286.8	292.3	292.9	292.5	296.1	299.5	301.4	303.1	305.2	310.0
8. Liquor Sales (T$)	11365.	7789.	9057.	8917.	10464.	7102.	7868.	8455.	9863.	6622.	7478.	8180.

[1]Revised series. Estimates of the national income and product accounts, of which disposable personal income is a part, have been revised by the U.S. Department of Commerce for the last three years. As is usually done in July, new source data have been incorporated and seasonal factors have been updated. More information regarding the revisions can be found in the July, 1984 issue of the U.S. Department of Commerce publication, Survey of Current Business.

[2]Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers, not the CPI-U.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
Series 3,5: Business Week. Monthly personal income for states, regions, and the U.S. Reported monthly.
Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 9: Employment and Labor[1]

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. Civilian Labor Force	247523.	243298.	257820.	258974.	251909.	250258.	267248.	273592.	256902.	253365.	261676.	261271.
2. Employment	237402.	230717.	243696.	243798.	233790.	225488.	242087	253149.	239275.	236361.	245871.	248480.
3. Unemployment	10121.	12581.	14123.	15177.	18120.	24770.	25161.	20443.	17627.	17005.	15805.	12791.
4. Unemployment Rate	4.1	5.2	5.5	5.9	7.2	9.9	9.4	7.5	6.9	6.7	6.0	4.9
5. Initial Claims Filed	8837.	11237.	11225.	10894.	14183.	15650.	10951.	8657.	10507.	10502.	7271.	5256.
6. Applications Received	10537.	12070.	14838.	15359.	13102.	12970.	11787.	12144.	9359.	10290.	11541.	11375.
7. New Non-Agricultural Openings	8010.	6119.	8344.	9190.	7035.	4724.	6185.	7992.	5528.	4679.	9779.	12905.
8. New Non-Agricultural Placements	6931.	5138.	7161.	8079.	5450.	4106.	6608.	10529.	6446.	5946.	9111.	10348.
9. Miners' Average Weekly Hours	42.5	42.0	41.7	39.7	38.1	39.9	39.5	41.8	39.2	42.9	43.0	43.5
10. Miners' Average Weekly Pay ($)	459.64	476.53	480.37	471.92	464.35	490.14	490.96	521.24	493.28	549.49	560.15	562.46
11. Miners' Average Hourly Wage ($)	10.81	11.34	11.52	11.90	12.18	12.27	12.43	12.47	12.58	12.81	13.03	12.94

[1]The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published quarterly.

Table 10: Energy and Mineral Production

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. Wyoming Coal (TST)	23556.	26586.	25809.	24257.	26054.	25400.	24746.	29784.	29546.	32626.	28942.	31806.
2. U.S. Coal (TST)	224793.	219743.	209771.	195253.	189307.	190260.	180439.	204117.	197690.	226875.	223538.	246163.
3. Wyoming Oil (TBPD)	358.	358.	354.	324.	324.	321.	311.	325.	318.	309.	307.	307.
4. U.S. Oil (TBPD)	8566.	8629.	8657.	8653.	8679.	8679.	8658.	8680.	8682.	8648.	8675.	8662.
5. Wyoming Natural Gas (MCFD)	1068.	1136.	1138.	1075.	1306.	1128.	1222.	1011.	1322.	1348.	1255.	INA
6. U.S. Natural Gas (MCFD)	53728.	55449.	50977.	48349.	48335.	47208.	42668.	44279.	48424.	52491.	48397.	INA

Sources: Series 1,2,5, and 6: U.S. Department of Energy. Energy Data Reports. Gas data are published monthly, and coal data are published weekly.
Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production published weekly.

Table 11: Government

Calendar Quarters	4/81	1/82	2/82	3/82
1. Sales and Use Tax Collections (T$)	68766.	73830.	66759.	65903.
2. Violent Crime[1]	553.	373.	389.	411.
3. Nonviolent Crime[2]	5299.	4811.	5778.	6346.
4. Stolen Property (T$)	3201.	3541.	4562.	3982.
5. Stolen Property Recovery Rate	58.6	46.9	49.3	42.8
6. Percent of Crimes Cleared[3]	22.3	24.9	21.0	20.1

[1]Murder, negligent homicide, forcible rape, robbery, aggravated assault.
[2]Burglary, larceny, auto theft.
[3]Clearance of a crime indicates resolution of a complaint by arrest or other

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and U monthly.
Series 2-6: Uniform Crime Reporting Center for Criminal Justice R General. "Crime in Wyoming." Published quarterly.

4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
61208.	56909.	46453.	53361.	55424.	55954.	51151.	57132.
295.	301.	274.	409.	241.	221.	318.	350.
5093.	4802.	4821.	5319.	4219.	3728.	4486.	4790.
2963.	3176.	2918.	3005.	2892.	2065.	2627.	2835.
42.8	46.5	36.9	40.3	46.1	42.7	42.9	51.5
21.3	22.8	21.8	24.2	23.5	30.9	22.4	22.9

extraordinary means.

e Tax Division. "Net Collections by Business Class by County." Published

search, Division of Criminal Identification, Office of the State Attorney

Table 12: Tourism

Calendar Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
Visitors, National Parks and Monuments												
1. Yellowstone	149682.	82758.	600071.	1614242.	116082.	65368.	553986.	1653211.	133088.	63927.	536765.	1561475.
2. Grand Teton	393843.	185935.	820236.	2066704.	371007.	183675.	686326.	1462761.	238442.	136459.	522640.	1373523.
3. Devil's Tower	18159.	9425.	86305.	161989.	13232.	8912.	87506.	160953.	16894.	9037.	72461.	131447.
4. Fossil Butte	1018.	596.	6691.	10303.	1601.	626.	5134.	9120.	4206.	246.	4246.	9107.
5. Fort Laramie	10190.	5037.	31447.	51881.	6906.	4887.	28311.	56592.	7665.	2352.	27529.	54704.
6. Big Horn NRA-South[1]	27820.	17701.	42059.	53839.	30720.	13428.	44977.	56419.	29358.	18715.	45104.	67403.
Other Tourism Indicators												
7. Traffic Count (Avg. # of Vehicles/Day)	103438.	103864.	126037.	166170.	97692.	84187.	122665.	167385.	97696.	85780.	125371.	169579.
8. Hotel, Motel, and Camp Sales Tax (T$)	1447.	1247.	1273.	2226.	1323.	912.	1048.	2017.	1397.	979.	1084.	2178.
9. Gasoline Sales (TGL)	87500.	72548.	93556.	108733.	81347.	71330.	81160.	107116.	79911.	63980.	85891.	INA

[1]Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
Series 8: Wyoming Department of Revenue and Taxation monthly report.
Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 13: Utilities[1]

Calender Quarters	4/81	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84
1. Residential Electric Connections	174369.	174018.	174126.	177081.	177968.	179111.	179717.	178762.	178535.	179967.	179536.	178837.
2. Residential Electric Consumption (TKWH)	218361.	504636.	375401.	302786.	391608.	489892.	392223.	294755.	395182.	562483.	437086.	359496.
3. Commercial Electric Connections	30047.	30833.	31086.	30841.	30388.	30772.	31194.	30533.	31404.	32340.	32462.	32874.
4. Commercial Electric Consumption (TKWH)	303091.	354594.	319879.	331351.	327961.	351633.	327565.	353743.	342219.	485953.	437983.	455181.
5. Industrial Electric Connections	3590.	3581.	3451.	3702.	3751.	3647.	3667.	3655.	3624.	3119.	3150.	3122.
6. Industrial Electric Consumption (TKWH)	1156967.	1266782.	1179112.	1178792.	1225845.	1471528.	1388817.	1397176.	1016334.	1456749.	1911229.	2049121.
7. Other Connections[2]	3652.	4520.	4778.	3243.	2857.	2819.	3059.	3164.	2791.	2759.	3155.	3438.
8. Other Consumption (TKWH)	79409.	48237.	31570.	70139.	12240.	6780.	8710.	46427.	13306.	6129.	13775.	50031.
9. Residential Natural Gas Connections	74828.	75677.	75413.	74861.	75955.	76567.	76449.	74638.	75037.	76263.	75081.	74802.
10. Residential Natural Gas Consumption (TCF)	2499236.	4607468.	2504865.	872772.	2972244.	6531664.	8926691.	2871311.	8444801.	15230399.	8356402.	2804867.
11. Commercial Natural Gas Connections[3]	6393.	6482.	6552.	6452.	6476.	6873.	6869.	6710.	6817.	6881.	6817.	6770.
12. Commercial Natural Gas Consumption (TCF)[3]	943319.	1955899.	1075767.	385052.	1196763.	3667569.	5716746.	1792146.	4865053.	9496853.	5231096.	1656779.
13. Industrial Natural Gas Connections	89.	89.	90.	90.	95.	97.	97.	97.	98.	94.	95.	96.
14. Industrial Natural Gas Consumption (TCF)	7479593.	7328389.	5335475.	5564715.	7918440.	7626560.	10221456.	9291988.	13201149.	13193998.	25099377.	12505089.
15. Other Natural Gas Connections[3]	398.	400.	404.	409.	409.	48.	48.	46.	45.	45.	46.	46.
16. Other Natural Gas Consumption (TCF)[3]	196349.	299920.	134722.	44697.	138389.	176.	322.	5323.	267.	235.	905.	5882.

[1]Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

[2]"Other" includes agriculture, municipal, and other public.

[3]Figures for the first and second quarter of 1983 reflect a change in the authority connections/consumption made by the Northern Utilities. Prior to January 1983, the company listed public authority under the category of other natural gas connections/consumption. Northern Gas now combines public authority connections/consumption with their commercial natural gas connections/consumption.

NOTE: Due to divestiture, Mountain Bell is no longer able to provide IPR with the telephones in service figure; because Mountain Bell accounts for the bulk of telephone mainline service in Wyoming, IPR has decided to discontinue the telephone data series.

Sources: Series 1-18: Reports to IPR by selected electric, natural gas, and telephone utility companies. Survey conducted monthly.

Wyoming Comparative Cost of Living Index* (October 4-6, 1984): Cheyenne = 100

City	Rank	All Items	Food	Housing	Transportation	Medical
Jackson	1	116.33	107.69	135.10	101.48	102.78
Evanston	2	115.05	99.33	140.13	102.28	102.69
Gillette	3	109.92	104.09	122.31	102.99	104.91
Sheridan	4	108.14	108.38	116.70	98.95	101.48
Sundance	5	106.50	103.94	116.09	97.02	108.30
Kemmerer	6	106.43	96.28	119.12	99.24	101.50
Pinedale	7	105.85	110.28	107.82	101.79	104.18
Rock Springs	8	105.61	104.94	110.14	102.98	97.22
Casper	9	102.72	103.70	101.16	105.67	108.49
Cody	10	101.36	109.46	99.25	98.42	102.01
Buffalo	11	100.92	107.02	98.03	98.22	101.14
Laramie	12	100.77	105.55	101.20	98.42	95.35
Cheyenne	13	100.00	100.00	100.00	100.00	100.00
Wheatland	14	99.91	101.05	96.40	101.86	102.53
Douglas	15	99.07	101.11	95.69	97.90	105.68
Worland	16	98.81	106.37	94.98	97.21	100.68
Thermopolis	17	97.65	108.57	91.92	96.35	98.57
Rawlins	18	96.68	105.46	92.24	100.39	93.83
Newcastle	19	96.49	101.64	90.51	96.99	105.45
Riverton	20	96.19	101.44	91.30	98.87	100.61
Greybull	21	95.03	106.55	83.02	98.12	101.56
Lusk	22	94.05	103.81	82.85	98.60	97.68
Torrington	23	93.63	94.52	90.17	93.10	96.45

*Apparel and Recreation Indices not shown.

Source: Wyoming Department of Administration and Fiscal Control.

Average Rents by City, Third Quarter 1984*

City	Average Apartment Rent	Average Trailer Lot Rent
Cheyenne	321.01	117.50
Buffalo	312.73	105.00
Casper	302.47	141.00
Cody	332.82	105.00
Douglas	333.69	117.50
Evanston	434.18	202.00
Gillette	351.57	175.50
Greybull	211.00	75.00
Jackson	401.50	116.67
Kemmerer	388.75	130.00
Laramie	348.69	121.67
Lusk	241.67	90.00
Newcastle	298.13	87.50
Pinedale	285.53	87.50
Rawlins	283.71	122.50
Riverton	307.33	115.00
Rock Springs	324.80	156.25
Sheridan	322.44	127.50
Sundance	233.89	85.00
Thermopolis	305.63	110.00
Torrington	248.12	57.50
Wheatland	283.33	100.00
Worland	291.33	119.17

*Prepared by Research and Statistics, Department of Administration and Fiscal Control.

Format

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 4th quarter of 1981, and end with the 3rd quarter of 1984. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Most annual data series will reappear in WQU only when updated, or about every fourth issue. Quarters are calendar quarters. For example, the 3rd quarter is composed of July, August, and September. In the table headings and narratives, a particular quarter will be indicated by notation such as 2/80 (2nd quarter, 1980), 1/80 (1st quarter, 1980), and so on.

Beside each data series name is an abbreviation in parentheses. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the state unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronymn "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board Feet

TKWH - Thousand Kilowatt Hours

$ - Dollars

M$ - Millions of Dollars

B$ - Billions of Dollars

T$ - Thousands of Dollars

H$ - Hundreds of Dollars

ST - Short Tons

TST - Thousands of Short Tons

MCFD - Million Cubic Feet Per Day

TBPD - Thousands of Barrels Per Day

GL - Gallons

TCF - Thousands of Cubic Feet

KWH - Kilowatt Hours

TGL - Thousands of Gallons

HBBL - Hundreds of Barrels

HMCF - Hundreds of MCF Per Day

HST - Hundreds of Short Tons

$/ST - Dollars Per Short Ton

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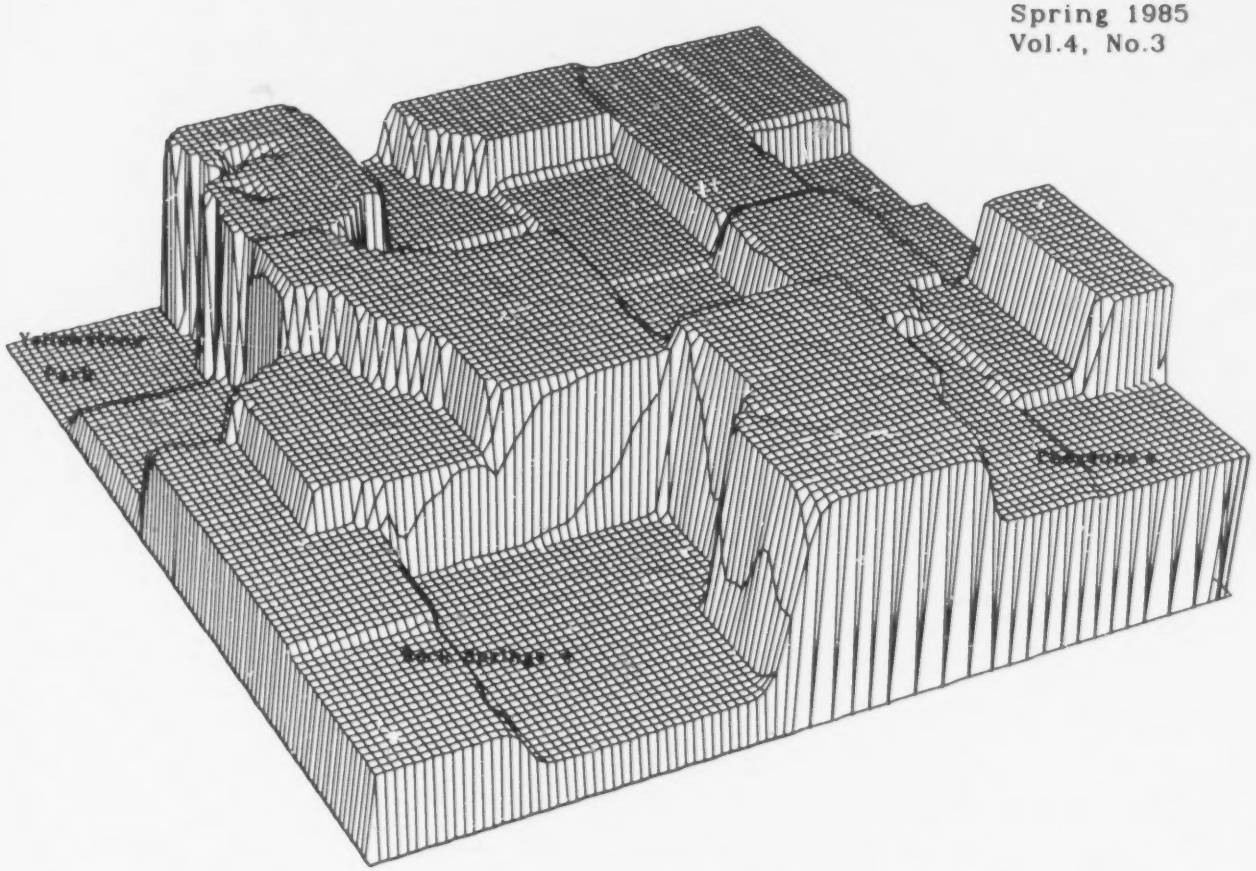
WYOMING QUARTERLY UPDATE

Spring 1985
Vol.4, No.3



IPR

All Cattle and Calves on Wyoming Farms and Ranches
by County, January 1, 1984

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing, cheerful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

Efforts to expand the subject and geographic detail (county data) of data sets will be made continuously. Featured for the fourth time in this edition is an industry profile. In this edition, a discussion of the cattle industry is presented.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a contour map depicting all cattle and calves on Wyoming farms and ranches by county, January 1, 1984.

First-time readers of WQU should refer to the "format" explanations on page 48 for keys on how best to use and interpret data presented in this publication.

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OTHER IPR SERVICES AND RESEARCH REPORTS ARE LISTED ON PAGE 49 OF THIS WQU.

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UNIVERSITY OF WYOMING

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Wyoming Quarterly Update is published four times per year in fall, winter, spring, and summer editions.

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WYOMING SCENE

Overview and Perspective

The U.S. economy emananted mixed signals during the opening months of 1985. Growth in the Gross National Product slowed to 2.1 percent during the first quarter, considerably below the 4 percent rate many economists had expected. At the same time, the implicit price deflator, a measure of inflation tied to the GNP, rose at an annual rate of 5.4 percent during the first quarter, the fastest rate since the 5.6 percent pace registered for the second quarter of 1982.

Economists disagreed as to what the numbers might portend. Commerce Secretary Malcolm Baldridge discounted the rising inflation number, saying it was the result of several one-time factors, including a government pay raise. Other economists agreed, but added that the growing signs of weakness probably meant the economy would not reach the 4 percent growth rate predicted by the Reagan Administration for 1985.

On the positive side, consumer spending continued to grow through early 1985. In February, retail sales rose 1.4 percent to $112.1 billion, following a 0.5 percent rise in January. At the same time, the Composite Index of Leading Indicators showed gains in eight of 11 categories during January. Positive direction was registered in new orders of manufacturers of consumer goods and materials, consumer credit, money supply, stock market prices, business formations, home-building permits, vendor deliveries, and initial unemployment claims. On the negative side, contracts and orders for new plant equipment, hours worked per week, and materials prices all slipped during the month.

The first quarter also witnessed both positive and negative signs in employment. The service sector displayed considerable strength, gaining by 225,000 jobs in February, of which 100,000 new jobs were added in business and health-related services. Over the preceding year, job growth in services accounted for about four-fifths of all new jobs.

On the negative side, jobs in goods-producing industries fell by 136,000 in February, reflecting declines of 55,000 jobs in hardgoods manufacturing and 52,000 jobs in construction. In addition, factory employment fell 77,000 jobs, with the auto industry posting a decli e of 25,000. A number of factors, including the ambitious nature of Detroit's first quarter auto production schedule and the weather-sensitivity of construction, pointed to the severe winter weather in the central states as a major factor in production employment declines.

Overall, the jobless rate of February--at 7.3 percent--remained within the narrow range between 7.1 percent and 7.5 percent where it has been stuck since last May. The total number of unemployed persons was 8.4 million in February, down 85,000 from January.

Weakness in production sector employment was one indication of a strong U.S. dollar overseas and a flood of foreign imports, which have effectively capped U.S. production and inhibited gains in manufacturing employment. The U.S. merchandise trade deficit deepened by

$10.3 billion in January, after posting a record $123.3 billion deficit for 1984. Economist Roger E. Brinner, chief economist for Data Resources, Inc., testified before Congress that budget deficits and a powerful U.S. dollar had cost the U.S. nearly 2 million jobs since 1980, most of them in manufacturing. He indicated U.S. export sales are 15 percent lower and U.S. import sales are 15 percent higher than would have been the case with a "normal" dollar.

At the same time, some economists were saying possibly during the first part of 1985 the U.S. became a net debtor nation for the first time since before World War I. By the end of the year, the U.S. could be the world's leading debtor nation, owing other countries as much as $100 billion, and perhaps owing as much as $1 trillion by 1989.

Despite its current difficulties, many economists are predicting the U.S. economy should remain generally healthy through 1985. Beyond that point, however, opinions are mixed. A poll of economists by the National Association of Business Economists, for example, found that 52 percent of those surveyed expected another recession to begin in 1986, with only 17 percent expecting the recovery to last into 1987 or beyond. The gigantic federal deficit was the biggest negative factor cited by the economists.

Federal farm policy occupied much of the Washington, D.C., political spotlight during the first quarter. President Reagan vetoed a measure that was intended to provide emergency credit to farmers caught between declining asset values and insufficient cash flows. In vetoing the measure, President Reagan said only about 4 percent of the nation's farmers were in need of immediate help.

However, a report prepared by the U.S. Department of Agriculture indicated that 93,000 U.S. farms, holding $47 billion in debt, were technically insolvent or on the verge of going broke. In addition, the report said of the 2.3 million farms in the U.S., 386,000--or nearly 18 percent of the total--are likely to be suffering financial stress.

In Wyoming, the minerals sector finished 1984 ahead of previous production expectations. This was especially true in the case of state coal production, which finished 1984 at 130.7 million tons, or 16.5 percent ahead of 1983 production (see "Minerals Outlook").

Agriculture in Wyoming, as in the nation generally, continued to experience difficulties. Recently released figures indicate that the state's 1984 lamb crop hit its lowest level since record-keeping began in 1924. The low level largely resulted from severe snowstorms that raked the state during the spring of 1984.

At the same time, dire warnings for agriculture were being raised in many quarters throughout the state. Members of the Wyoming State Legislature's Joint Agricultural Committee were indicating that slumping land values, high interest rates, and low commodity prices had helped precipitate the worst agriculture crisis in the state in decades. In an account published in the Casper Star Tribune, the Farm Bureau president in Fremont County was quoted as saying about one-third of the farmers and ranchers in the county were in financial trouble and risked going out of business by summer.

S.T. Mast, IPR

# #

Spring Minerals Outlook

OVERVIEW

In the last issue of the Wyoming Quarterly Update, I noted that our September production forecasts for oil, natural gas, and coal were all in need of upward revision. Although final numbers are not yet available for oil and gas production, even our revised December estimate of 125 million barrels of oil may fall as much as 1 million barrels short of the actual production. The revised estimate for natural gas is holding, although it looks like it might be closer to 585 billion cubic feet of gas than 600 billion cubic feet.

But coal is the real surprise. In December, we raised our earlier estimate of coal production from 120 million tons to 129 million tons. With the final figures now available from the State Inspector of Mines, coal production actually went to 130.7 million tons. This represents a whopping 16.5 percent increase over 1983.

Based on these revised figures or estimates for 1984, we have increased some of our near-term forecasts of oil, natural gas, and coal production above our previous forecasts of last year. These revised forecasts are presented in detail in the "Oil and Gas Update" and the "Coal Update" in this issue. Briefly, oil production looks like it will hold steady for another year before it again slowly begins to decline. Natural gas production will still show substantial increases each year, but at higher production levels than our past estimates. Coal, however, is not likely to repeat its spectacular growth of last year, and production reports for early 1985 suggest production is only keeping pace with 1984. We see only modest increases in coal production between 1985 and 1987, and nearly flat production levels between 1988 and 1990. Consequently, we only had to revise our 1985 forecast and our forecasts for the next two years, as our 1988 through 1990 forecasts still appear valid.

In regard to prices, the price of oil is now close to $26 per barrel. Natural gas and coal prices seem to be holding steady or falling only slightly. It is really still too early to feel any confidence in where prices are headed in 1985, particularly oil prices, which are still somewhat dependent on OPEC's plans, or rather, OPEC's ability to enforce it plans.

In closing, this issue of the Wyoming Quarterly Update comes at a good time, since it allows us to include discussions of new 1985 legislation affecting the mineral industry. These are presented in the appropriate updates.

Gary B. Glass, State Geologist, Wyoming Geological Survey

OIL AND GAS UPDATE

Our revised forecast for Wyoming oil and gas production is presented in table 1.

This revised forecast presents higher estimates of natural gas production, as well as a slower return to declining oil production, than our previous estimates.

Preliminary 1984 well completion statistics were recently released by Petroleum Information Corporation. They are summarized and compared with 1982 and 1983 as follows:

	New Field Wildcats				All Wells			
	Oil	Gas	Dry	Total	Oil	Gas	Dry	Total
1984	57	9	440	506	801	142	750	1,693
1983	23	13	305	341	698	152	550	1,400
1982	68	28	404	500	1,029	272	827	2,128

These well completion numbers dramatically illustrate the decreased interest in gas exploration, and the concurrent increased interest in oil exploration during the last two years. Basically, decreasing consumption, which has led to an oil and gas surplus, and decreasing prices in the case of oil (average of $31.77 per barrel in 1981, compared with $26.00 per barrel in 1984) have been responsible for the decline in activity in Wyoming. It does appear, however, that this trend may be reversing, as the total number of wells drilled increased from 1983 to 1984. The increase in new field wildcats is especially encouraging in terms of exploration trends. The majority of these new oil discoveries have been in the Powder River Basin as a result of the Minnelusa Play. Regionally, Wyoming was a close second to Colorado in total completions (1,693 to 1,745). Wyoming led the region in total footage drilled (12,153,100 feet), followed by Colorado (10,271,185 feet). The average depth for wells drilled in Wyoming was 7,178 feet. For 1984, rig activity ranged from 84 rigs to a high of 140, averaging 114.6. This was an increase from the average count of 95.6 for 1983. Petroleum Information Corporation projects a slight increase in activity in 1985, possibly 2 percent to 4 percent in terms of completions for Wyoming. They also project a slight increase in oil demand, which will be needed to stimulate drilling.

High bids from competitive oil and gas lease sales on federal lands in Wyoming totaled $29.5 million in 1984, an increase of more than $25 million from the money received from similar sales in each of the previous two years. The U.S. Bureau of Land Management noted that this increase was in large part a result of offering 542 parcels in 1984, as compared to 162 in 1983 and 121 in 1982. However, the February 1985 auction did indicate a decline in revenues from 1984 rates.

Wyoming's state oil and gas lease sale revenues are also on the decline. For fiscal year 1984, Wyoming saw an average of $26.28 per acre offered and $32.50 for each acre leased. So far in fiscal year 1985, the average is $22.60 for each acre offered and $26.46 for each acre leased. State lease sales in Montana,

Table 1: Wyoming Oil and Gas Production Forecast to 1991[1].

Calendar Year	Natural Gas Production (billions of cubic feet)	Oil Production (millions of barrels)
*1980	450.6	126.4
*1981	455.4	122.1
*1982	465.1	118.7
*1983	539.8	121.0
1984	585.0	126.0
1985	630.0	126.0
1986	675.0	125.0
1987	715.0	124.0
1988	750.0	123.0
1989	775.0	122.0
1990	800.0	120.0
1991	825.0	118.0

*These are actual values for comparison.

[1]Forecast by Wyoming Geological Survey, March 1985.

Colorado, Utah, and North Dakota are also reportedly showing revenue declines.

On a related note, the State Land Commissioner's Office is continuing efforts to revise the state's oil and gas lease form. Key issues, which are being contested by oil industry representatives, include accounting provisions, a provision ensuring royalties are based on the market value for the product, and stiffer penalties for noncompliance with the lease.

Another large natural gas plant is being planned in the Overthrust area by Chevron, U.S.A., Inc. The plant will serve East Painter Reservoir Field and Clear Creek Field, northeast of Evanston, Wyoming. The project will cost $180.6 million and will have a maximum capacity of 240 million cubic feet of gas per day.

Development of Exxon's high carbon dioxide (CO_2) gas in the Riley Ridge area remains in the news. It now appears that in addition to the enhanced oil recovery projects in Rangely, Colorado, and near Bairoil, Wyoming, the Powder River Basin of northeastern Wyoming and the Williston Basin of North Dakota are potential markets. These additional markets will necessitate the construction of a 642-mile pipeline from Rock Springs, Wyoming, to Tioga, North Dakota, plus an 18-mile spur to Bairoil, Wyoming, for a total of 660 miles of pipeline. Two lines are currently being considered for the segment from Rock Springs to Bairoil, one proposed by Exxon and one by Amoco. The two lines could, however, be combined into one. The segment from Bairoil to Tioga as proposed by Exxon is just one line.

Exxon's La Barge Project, which will supply the CO_2, is the largest industrial facility ever reviewed under the 10-year-old industrial siting process. The $2.2-billion plant includes several stages of development that could lead to a plant capable of producing over 1.86 billion cubic feet of gas per day, and which would have peak construction work forces in excess of 5,200 workers.

In a related story, the 1985 Wyoming Legislature failed to pass a bill seeking a 6 percent severance tax rate on carbon dioxide. This is the rate that the state contends is applicable to carbon dioxide. The petroleum industry argued that the 6 percent rate could seriously affect CO_2 sales, but also that the 6 percent rate only applies to combustible natural gas and not CO_2. It appears that eventually the question may have to be tested in the courts.

Governor Herschler signed into law a bill designed to lower natural gas prices by increasing competition. The bill will permit cities to negotiate for cheaper gas supplies and then require local gas companies to deliver it to homes and businesses. In the past, utilities serving cities negotiated contracts for supplies, and these contracts were subject to approval by the Wyoming Public Service Commission.

A bill which would have provided a severance tax break for production from wildcat wells was passed by the legislature this session, but was vetoed by Governor Herschler. The bill would have given a 4 percent severance tax break (reduced from 6 percent to 2 percent) for the first two years of production from a wildcat well.

The Governor did, however, sign two other bills giving tax breaks to segments of the oil industry, i.e., enhanced oil recovery projects and oil mining projects. Enhanced oil recovery projects begun after July 1985 would be subject to a severance tax of 1.5 percent for a period of five years, and then revert to the normal 6 percent in 1990. Oil mining projects would receive a cut from 12 percent to 1.5 percent in ad valorem and severance taxes (also for a five-year period).

The U.S. Department of Energy has awarded University of Wyoming researchers a $151,600 grant for a study of new enhanced oil recovery techniques for removing huge oil reserves currently locked up in known fields. The UW researchers estimate there are 18 billion barrels of oil in Wyoming beyond the reach of conventional techniques. The grant covers research through August 1986. Assistant Professor David L. Whitman of the Petroleum Engineering Department is the director for the project.

Also relating to enhanced oil recovery, the U.S. Department of Energy is working on a recovery project in the Shannon Reservoir in the Teapot Dome area in Natrona County, Wyoming. Steam will be injected into a 20-acre area in an attempt to increase oil recovery to 30 percent. If successful, 54 million barrels of the oil-in-place might be recoverable from the reservoir, compared to conventional techniques which may only recover an estimated 5 percent, or 9 million barrels.

Bennett Petroleum recovered 200 barrels of oil on a production test of the Cretaceous Muddy "J" Sandstone, eight miles south of Torrington. The potential new field discovery produced oil from perforations at 7,046 feet to 7,058 feet.

A new Hoback Basin gas discovery, 22 miles northwest of Pinedale, was completed by Home Petroleum. The discovery produced 320,000 cubic feet of gas per day from Cretaceous Dakota Sandstone. Production was from about 2,300 feet.

Milestone Petroleum recently completed two new Powder River Basin oil discoveries. Milestone opened a new pay discovery (Shannon Sandstone) in Lucky Lindy Field, flowing 230 barrels of oil per day. The field already produces from the Dakota, Turner, and Parkman sands. Also, 19 miles northeast of Lance Creek Field in Niobrara County, the company completed a wildcat for 318 barrels of oil per day from the Dakota.

Diamond Shamrock Exploration reported the completion of another prolific Minnelusa discovery, 21 miles northwest of Moorcroft. The well was completed for 1,025 barrels per day from 7,011 feet.

Diamond Shamrock also recently completed a Frontier oil and gas discovery in the southern Powder River Basin, 30 miles north of Glenrock near Buck Draw Field. Production tests yielded 158 barrels of oil and 245,000 cubic feet of gas per day from a depth of 12,670 feet to 12,724 feet. In addition, Diamond Shamrock completed another Frontier discovery five miles south of Ross, Wyoming, producing 1,067 barrels of oil and 1,980,000 cubic feet of gas per day from the Frontier.

W.A. Moncrief completed a Frontier discovery 18 miles southeast of Sussex in Johnson County. The well, which is over 12,000 feet deep, flowed 200 barrels of oil and 250,000 cubic feet of gas per day.

Hrubetz Oil announced completion of a 765-barrel-per-day oil discovery 10 miles southeast of Gillette. The well produces from the Minnelusa between 9,998 feet and 10,033 feet.

As these discoveries illustrate, the Powder River Basin remains the hot spot for Wyoming oil exploration.

Alan J. Ver Ploeg, Petroleum Geologist, Wyoming Geological Survey

COAL UPDATE

Preliminary data from the State Inspector of Mines indicate that Wyoming's coal production in 1984 was 130.7 million tons, an increase of 16.5 percent over 1983's record 112.2 million tons. This is the highest annual rate of increase since 1980 and eclipses even our latest prediction (Wyoming Quarterly Update, Winter 1984) by almost 2 million tons.

The unexpected surge in production from the Powder River Basin accounted for most of the increase: the 112.7 million tons produced from this basin in 1984 was up 20 percent over 1983. This county alone now accounts for nearly 82 percent of Wyoming's production. The Powder River Basin now accounts for about 86 percent of the state's production (see table 2).

A total of 28 coal mines reported coal production in 1984, with 16 mines reporting increased production and 12 mines reporting decreased production. Five of the state's coal mines produced over 10 million tons each, including Thunder Basin Coal Company's Black Thunder Mine. With 1984 production of 21.2 million tons of coal, Black Thunder remains the biggest coal mine in the nation and one of the most productive mines in the world. Kerr-McGee's Jacobs Ranch Mine (14.4 million tons) is now second in production, ahead of AMAX's Belle Ayr and Eagle Butte mines (13.4 million tons each). Thirteen of the Powder River Basin's 17 coal mines and 17 of the state's 28 coal mines produced in excess of 2 million tons each in 1984.

Despite the surge in coal production, employment at Wyoming coal mines decreased slightly in 1984. Current employment of 5,336 is at the lowest level since 1979. (NOTE: the preliminary employment number for 1983 given in the Spring 1984 Wyoming Quarterly Update should be adjusted upward to 855 for Carbon County and 5,041 for the state total.) An increase of 187 employees in the Powder River Basin in 1984 was more than offset by decreases of 197 in the Hanna Basin, 41 in the Green River Basin, and 14 in the Hams Fork Region. The employment decreases combined with the production increases mean that productivity (tons per miner) increased in 1984, and reflect a shift to the larger, less labor intensive surface mines in the Powder River Basin (as well as reflecting a statewide increase in overall mining efficiency).

Wyoming continued as the third largest coal producer in the nation, behind Kentucky's 165.5 million tons and only 0.2 million tons behind West Virginia's 130.9 million tons. National coal production of 890.1 million tons in 1984 set a new single-year record that was 13.8 percent higher than 1983 production (782 million tons) and 6.2 percent higher than 1982 production (838 million tons)--the previous record year. Wyoming now accounts for almost 15 percent of the nation's coal production and about one-fourth of the nation's production from surface mines. Contributing to the U.S. and Wyoming production increase was the 6

percent to 7 percent increase in coal consumption (related to continued economic expansion) reported by electric utilities for 1984. The national increase was aided by the build-up of coal stocks by utilities in anticipation of a United Mine Workers' strike that never materialized. This build-up of coal stocks was most probably not a strike-related factor in Wyoming coal production increases, but instead, was probably a build-up in response to the availability of very low-priced coal from large mines plagued with excess capacity.

Production projections for 1985 for both Wyoming and the U.S. will probably parallel one another. Since neither coal consumption nor demand for electricity is expected to grow more than a few percent in 1985, we have projected that Wyoming's coal production will increase by 2.5 percent to 134 million tons (see table 3).

Production for the Powder River Basin, which was near or even above contracted production in 1984, is expected to remain at approximately the same level in 1985. Statewide production was only 2 percent less than contracted production in 1984 and is expected to remain at this level in 1985 (implying less than contracted production or lost contracts in southern Wyoming). From 1986 to 1990, we expect to see the production curve flatten out, with annual rates of increase declining from 3 percent to 1 percent. Similarly, the amount of production below contract amounts will become less and less. By 1990, it is expected that both actual production and contracted production will reach 145.5 million tons.

Several coal tax bills introduced in the 1985 Wyoming Legislature are of importance to the state's coal industry. An attempt to extend the 2 percent Coal Tax Revenue Account (Impact Tax), which is due to expire when revenues from the tax reach $160 million, was not acted on. This tax is included in the state's base severance tax rate of 10.5 percent of the value of the coal. The tax has been in effect since 1975 and is used to help communities in the state mitigate impacts from coal development. Revenues from this tax have been used to finance construction and improvements of highways, roads, and streets, as well as public water and sewer projects. The revenues collected so far from this tax are an estimated $117,300,000 (Management Council, October 1984, Taxes on Wyoming's Minerals: History and Projections, Legislative Service Office, Cheyenne, p. 33).

The tax is due to expire in late 1985 or early 1986. Opponents of the tax argued that increases in federal royalties in the future would more than cover the loss in revenue when the Impact Tax expired. Accordingly, a bill that would substitute federal royalties for Impact Tax royalties was introduced and passed. Under this bill, royalties in excess of $200 million would be distributed as follows: 25 percent to current royalty revenue users; 37.5

Table 2: 1984 Wyoming Coal Production by County and by Coal Basin[1].

County	Production	Percent of Total Production	Number of Mines	Number of Employees
		POWDER RIVER BASIN		
Campbell	106,804,621	81.7	14	2,773
Converse	3,338,677	2.6	1	264
Sheridan	2,516,979	1.9	2	221
TOTAL	112,660,277	86.2	17	3,258
		GREEN RIVER BASIN		
Sweetwater	8,878,033	6.8	3	953
		HAMS FORK REGION		
Lincoln	4,069,771	3.1	2	463
		HANNA BASIN		
Carbon	5,095,008	3.9	5	658
		BIGHORN BASIN		
Hot Springs	42,690	<0.1	1	4
TOTAL WYOMING	130,745,779	100.0	28	5,336

[1]Source: Wyoming State Inspector of Mines, 1984 Annual Report (in preparation).

Table 3: Coal Production and Forecast to 1990 (Millions of Tons).

	1981[1]	1982[1]	1983[1]	1984[1]	1985	1986	1987	1988	1989	1990
Campbell County	71.6	81.2	88.2	106.8	109.2	111.5	112.0	112.5	113.0	113.2
Converse County	3.6	3.4	2.7	3.3	5.4	5.0	6.0	6.3	6.3	8.6
Sheridan County	2.8	3.0	2.9	2.5	3.0	3.0	3.0	3.0	2.7	1.2
Carbon County	8.5	5.0	4.8	5.1	5.0	5.0	5.0	5.0	5.0	5.0
Sweetwater County	11.2	11.0	9.5	8.9	9.5	9.5	10.5	11.5	12.5	12.5
Lincoln County	5.0	4.3	4.0	4.1	4.0	4.0	5.0	5.0	5.0	5.0
Hot Springs County	M[2]	M	M	M	M	M	M	M	M	M
TOTAL WYOMING	102.8	107.9	112.2	130.7	134.0	138.0	141.5	143.3	144.5	145.5
Increase Per Year	9%	5%	4%	16.5%	2.5%	3%	2.5%	1%	1%	1%
Estimated Contracted Production	110.0	119.0	122.6	133.0	137.0	143.0	144.5	144.5	144.5	145.5
Below Contract	7%	9%	8%	2%	2%	4%	2%	1%	0%	0%

[1] These are actual values for comparison.
[2] M means minor tonnage (less than 0.1 million tons).
Forecast by Wyoming Geological Survey, March 1985.

percent to cities, towns, and counties; and 37.5 percent to an account that the legislature can use at its discretion to mitigate impacts of mineral development.

Another bill concerning coal severance taxes was introduced during the legislative session, but failed. This bill was designed to give producers of high-cost coal an 80 percent severance tax credit on coal that exceeded $10 a ton to produce, provided that the producer had coal reserves with an effective stripping ratio of 8 to 1 and provided that the producer had been mining continuously for 10 years. The bill was intended to give producers in southern Wyoming (especially the Hanna Basin) tax relief so they might compete more effectively with other producers.

In coal market news, a Hanna Basin mine, Arch Mineral Corporation's Seminoe No. 2, announced that 12 employees had been laid off. Production decreases related to a reduction in coal sales caused the mine to cut back to a five-day schedule, to take a dragline out of operation, and to lay off the workers late in 1984. Also in the Hanna Basin, the state's only operating underground mine, Carbon County Coal Company's Carbon County No. 1, announced in November 1984 that Northern Indiana Public Service Company (NIPSCO), the mine's only customer, was changing from a monthly to a weekly shipment schedule. The coal company also announced that it was gathering information in the Hanna area on the possible impacts of this mine closing down. Although no plans for layoffs or shutdowns have been announced, Carbon County Coal Company's contract with NIPSCO is scheduled to be renegotiated in June 1985. Coal from this mine is currently the highest quality coal mined in the state (as-received heating values of 11,000+ BTU/lb), but is also the most expensive coal (both FOB and delivered) in the state.

The only mine in the Bighorn Basin of northwestern Wyoming (Hot Springs County), Northwestern Resources' Grass Creek strip mine, appears to have a new coal contract. Holly Sugar Company announced in February that its sugar beet processing plant in Worland would be converted to coal-fired boilers in 1986 and would use 170 tons of coal daily for its five months of operation, for a total of 25,500 tons. The Grass Creek Mine, located about 55 miles west of Worland, produces a high-quality, high-volatile, C bituminous coal in a surface mining operation that is rumored to be the only mine west of the Mississippi using a mountain-top removal method of mining. The mine produced 42,690 tons of coal in 1984 and had four employees.

The most significant news in Wyoming's coal transportation industry in early 1985 was the announcement that the Chicago and North Western Transportation Company (C&NW) was planning to extend its new line in the southern Powder River Basin about 10 miles farther north in order to serve three additional coal mines. The present rail line, which was completed in 1984 as a joint venture with Union Pacific (UP), now serves only the southern mines in the basin, mainly the North Antelope, Black Thunder, Jacobs Ranch, and Coal Creek mines. The proposed extension would give Carter Mining Company's Caballo, AMAX Coal Company's Belle Ayr, and Mobil Coal Producing's Caballo Rojo mines a choice of railroads to haul their coal. These three mines currently are only served by Burlington Northern. The new line proposed by C&NW is expected to cost about $25 million and would probably double this railroad's present potential for contracts. Sunedco Coal Company, which owns the Cordero Mine (between the Coal Creek and Caballo Rojo mines), is expected to announce that it will build a short spur line to connect with Coal Creek.

In related news, C&NW and UP, the partners

in the joint venture railroad, recently signed another coal-hauling contract. The new long-term agreement is the fourth major contract signed by the companies and calls for hauling about 1.8 million tons per year from Kerr-McGee's Jacobs Ranch Mine to Central Louisiana Electric's Rodemacher Plant in Louisiana.

Richard W. Jones, Coal Geologist, Wyoming Geological Survey

METALS AND PRECIOUS STONES UPDATE

To generally summarize the state's metals activity for the past quarter: it was slow, as would be expected at this time of the year. Some of the reported activities of interest to Wyoming include:

(1) U.S. Steel Corporation's sale of the Atlantic City iron mine to Universal Equipment Company;
(2) the purchase of Superior Oil Company and its Minerals Group by Mobil Oil (Superior has gold and diamond interests in Wyoming);
(3) continued dewatering of the historic Carissa gold mine;
(4) proposed placer gold-platinum dredging in the Douglas Creek District; and,
(5) compilation of the preliminary results on diamond-bearing kimberlite exploration research; mapping and wall-rock alteration studies in the Lewiston gold district; and mapping and studies of the economic geology of the Copper Mountain District in the Owl Creek Mountains by the Geological Survey of Wyoming's Metals Section.

The sale of the Atlantic City iron ore mine to Universal Equipment Company ended more than two decades of ownership by U.S. Steel Corporation. From 1962 to 1983, more than 90 million tons of iron ore were produced and shipped to the Geneva Steel Works near Provo, Utah. The remaining iron resources at the mine are unknown, although it has been reported that at least 10 years of reserves (? 50 million tons) are present.

Universal presently has a contract with the Wyoming Highway Department to supply road aggregate from mine dump tailings. The company also plans to sell all mobile mining equipment from the property, but no other plans have been made public.

The iron-formation which was mined at the Atlantic City open pit may also be gold-bearing. The potential for gold in the iron-formation is strengthened by a report that the historic Lone Star gold mine was developed on a vein in, or adjacent to, the iron-formation. This mine, which produced an estimated 2,100 ounces of gold (Hausel 1980), was reportedly located adjacent to the U.S. Steel iron mill and has long since been covered by mine tailings.

In addition, the iron-formation at the mine is part of the Goldman Meadows Formation, which crops out in the South Pass supracrustal belt. This belt forms a large synclinorium with Goldman Meadows metasediments cropping out along the northwest and eastern flanks of the belt. On the opposing limb of the synclinorium from the Atlantic City Mine, a small wedge-shaped exposure of iron-formation near the Lewiston gold district is gold-bearing. Samples from this iron-formation assayed 0.01 to 0.04 ounce of gold and a trace to 0.10 ounce of silver per ton.

Whether or not the iron-formation in the Goldman Meadows Formation at the Atlantic City Mine contains economic gold mineralization is not known. It appears that at least minor amounts of gold are present.

Superior Oil Company's Minerals Group is in danger of being disbanded or sold by Mobil Oil. Superior has been exploring for Witwatersand-type gold deposits in Wyoming and for diamondiferous kimberlite in the Colorado-Wyoming State Line District. Superior's diamond program has had promising results. Testing of the Sloan 1 and 2 pipes in the State Line District resulted in the recovery of an average grade of 0.2 carat per ton (Gold 1984). Commercial deposits range from 0.01 carat to as high as the unusually rich Australian Argyle pipe which has grades up to 6.8 carat per ton. Average diamond ore runs about 0.25 carat per ton.

At the low end of the commercial grade deposits, a diamond deposit must be supplemented by periodic finds of very large gem quality diamonds, which so far are lacking in the State Line District. Diamonds recovered from the State Line District have been up to one carat with gem-quality-to-industrial-quality ratios typical of many South African deposits (about 10 percent to 20 percent gems).

Dewatering of the Carissa gold mine near South Pass City continues. This mine is reportedly one of the two largest historic producers of lode gold in the state. Estimated production was about 52,680 ounces of gold (Hausel 1980). The average grade of ore was reported as 0.32 ounce of gold per ton.

A Wyoming prospector is seeking a small mining permit to dredge parts of Douglas Creek for gold and platinum. The Douglas Creek-Keystone District on the east flank of the Medicine Bow Mountains is a well-known gold-copper-platinum district. Portions of Douglas Creek were last dredged in 1958. Total gold production from both placer and lode deposits in this district is estimated at 12,500 ounces (Curry 1965).

During the past quarter, the Geological Survey of Wyoming's Metals Section compiled data and analyses of samples from the Lewiston District. A preliminary map of the district was prepared (Hausel 1984), and some results on wall-rock alteration and mineralization are in preparation for publication.

Interesting assays of some selected and grab samples in the Lewiston District include:

Mine Name	Gold (ounce/ton)
Gold Leaf	1.29
Iron Duke	0.21
Hidden Hand	0.05
Bobtail (Good Hope)	1.18
Wolf	0.68

The Geological Survey of Wyoming's stream sediment sample concentrates, which were panned from streams in the central Laramie Range, continued to produce kimberlitic satellite minerals. In one sample taken in the Silver Crown District, several flakes of gold were also found.

More than two dozen heavy mineral (pyrope garnet, chromian diopside, picro-ilmenite) anomalies have been identified in the Pole Mountain-Happy Jack region to the west of Cheyenne. Based on the sample distribution, several kimberlite intrusives are required to explain the anomalies. To date, only one 100-foot-diameter pipe has been discovered in the region by the Geological Survey of Wyoming. Samples from the Pole Mountain pipe, and samples of lamproite collected from the Leucite Hills in the Green River Basin, are being tested for diamond.

Finally, a report on the supracrustal rocks and economic geology of the Copper Mountain District in the Owl Creek Mountains has been published (Hausel et. al., 1985) by the Geological Survey of Wyoming. The report describes the potential for stratiform gold and tungsten deposits in the region and examines a well-mineralized 30-foot to 50-foot wide tholeiitic dike that hosts significant copper, gold, and silver.

W. Dan Hausel, Deputy Director, Wyoming Geological Survey

URANIUM AND INDUSTRIAL MINERALS UPDATE

Uranium

Layoffs continued within the uranium industry. Between March 1 and July 1, Pathfinder Mines, a branch of the French company COGMEA, will lay off about half its work force at Gas Hills. These layoffs are due to the modification of the Lucky Mc mill to a more modern and less labor-intensive facility, and to the reduced demand for uranium.

Wyoming's uranium industry entered 1985 with five operating mines (COGMEA in Gas Hills, Crooks Gap, and Shirley Basin; Getty Oil Company in Shirley Basin; and Rocky Mountain Energy in the southern Powder River Basin).

On an encouraging note, industry officials report that utilities are now beginning to plan purchases of uranium for electricity production because their current stockpiles are beginning to shrink. With most of the large oil companies out of the uranium business, there may be more opportunity for the smaller, traditionally-oriented uranium companies to resume mining. The main question is whether utilities will favor a domestic source of uranium, even at a slightly higher cost (the price of uranium virtually does not affect the cost of electricity), over foreign (mostly Canadian and Australian) uranium sources.

In February of this year, Saarberg Interplan, a West German company, expressed interest in uranium exploration in Wyoming. Saarberg is apparently investigating uranium potential in both Wyoming and Texas.

Trona

Trona production is remaining steady at reduced levels, with no large production increases foreseen. As seen in the following table, the Geological Survey of Wyoming has revised its trona production forecasts to reflect this lack of anticipated growth:

Wyoming Trona Production Forecast[1]

1981*	11.8
1982*	10.1
1983*	10.5
1984	10.4
1985	10.4
1986	10.5
1987	10.6
1988	10.8
1989	11.0

*Actual production figures from the Wyoming Ad Valorem Tax Division.
[1]Wyoming Geological Survey, February 1985.

Allied Chemical Company announced that it was cutting production of soda ash from Wyoming trona and laying off more Wyoming workers, while at the same time increasing production of soda ash from its synthetic soda ash plant in Syracuse, New York. According to an Allied spokesman, although Wyoming trona costs much less to produce, rail transportation costs make Wyoming soda ash more expensive on the East Coast where most of the consumption of soda ash occurs. These transportation costs are one reason why the Wyoming trona industry has been unsuccessful in establishing an export market.

Bentonite

Bentonite production continues to grow in a market characterized by low prices. Consequently, revenue is down even though bentonite production has increased. Transportation costs are less of a factor in bentonite production than in trona production in Wyoming, since Wyoming supplies most of the western bentonite used in the drilling, refining, and steelmaking industries, and high transportation costs affect all producers about equally.

Other Industrial Minerals

The production of gypsum, sand and gravel, and other industrial minerals is expected to increase in 1985. There is a possibility for substantial growth in sand and gravel production if the full MX missile program is approved. Specialty sand and gravel (aggregate) will be needed to produce the hardened concrete in the silo structures. Also, if the Chicago and North Western Railroad extends its Powder River Basin line, additional ballast will be needed by late 1985 or 1986. Most of this ballast will probably come from the Lusk area, since this was the source for the ballast used in the existing spur.

Ray E. Harris, Uranium and Industrial Minerals Geologist, Wyoming Geological Survey

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Spring Agricultural Outlook

Uncertainty concerning the 1985 Agricultural Farm Bill clouds the agricultural outlook as we move into spring. Historic U.S. agricultural price support and supply control programs are being closely scrutinized by Congress, and unforeseen changes in government policies toward agriculture are almost certain.

Changes in U.S. agriculture have been brought about by ties to the general economy at home and abroad. A worldwide recession has slowed the demand for agricultural products in the 1980s, while global production capacity remains relatively large. This has resulted in slow growth in agricultural consumption and has meant increased competition from other countries for international markets. U.S. agricultural exports have been hurt by the strong dollar that results in higher prices for U.S. products in world markets.

The years ahead are likely to see U.S. agriculture more closed tied to other sectors of the economy around the world and become even more closely linked to economic development in other countries. Greater interdependence and more intense competition for global agricultural markets may be spurred by worldwide adaption of new productivity-expanding technology. It is within this environment that new legislation will be considered: an environment that already promises large, global agricultural production capacity and slow demand growth, but one that also holds much uncertainty about the future.

The total number of cattle and calves on farms in the U.S. on January 1, 1985 was estimated by USDA at 109.8 million head. This was down 3 percent (4 million head) from 1984 and was the lowest estimated number of cows since 1960. January 1, 1985 beef cow numbers, at 35.4 million head, were down 6 percent from last year. Beef cow numbers in Wyoming dropped 7.5 percent, from 668,000 to 618,000 head. However, heifers held for beef cow replacements increased slightly (2 percent) in Wyoming. This bucked the national trend, which indicated a 6.5 percent decline in beef heifers held for replacement.

The 1984 calf crop for the U.S. was estimated at 42.5 million head. This was down 3 percent from 1983 and was the smallest calf crop since the 42.6 million head reported in 1963.

Continued reduction in total cattle numbers during 1985 seems highly probable based on estimates in the January report. The 1985 calf crop undoubtedly will be smaller with a lower cow herd, making the fifth year in a row of lower calf crops.

Estimeted supplies of calves and lighter yearling feeder cattle outside of feed yards available for grazing programs and non-feed slaughter were lower by 4 percent from last January. This will result in tight supplies for grass type feeder cattle in Wyoming and other Northern Great Plains states.

Lower feeder cattle supplies already are being reflected in higher prices for yearlings and calves. As 1985 progresses, the demand for feeder cattle will result in higher feeder cattle prices than have been observed for the past three to four years. Another smaller calf crop this year will provide fewer animals into the feeder cattle supply. Feeder cattle supplies are expected to be noticeably tighter throughout the next two to three years, with resulting stronger prices.

U.S. lamb numbers continued a persistent decline that has been ongoing since World War II. All sheep and lamb inventory in the United States on January 1, 1985 totaled 10.4 million head, down 9 percent from a year earlier. This is the lowest number of sheep and lambs reported in the U.S. since inventory records were begun 100 years ago.

The number of sheep and lambs on farms and ranches in Wyoming on January 1, 1985 declined 21 percent from a year earlier, to 860,000 head. The stock sheep total dropped 23 percent, the lowest state inventory since 1884.

The 1984 lamb crop for Wyoming totaled 540,000 head, 21 percent below 1983, and also the lowest since records were begun in 1924. Sheep producers averaged 73 lambs per 100 breeding ewes, compared to 96 lambs per 100 ewes in 1983. This sharp reduction was due primarily to the severe winter of 1983-1984 and the late April blizzard that hit the northeast corner of the state.

The reduced lamb supplies in 1985, plus the upward price movement on other red meat products, should push lamb prices to levels above the past three to four years.

Livestock producers should be able to anticipate prices 3 percent to 5 percent above levels that existed in 1984.

Robert D. Carver, University of Wyoming

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Job Openings Outlook

Air Traffic Controllers

In Wyoming, college graduates or individuals who have civilian or military experience as controllers, pilots, or navigators will find favorable employment opportunities for air traffic controllers. Many people come to Wyoming to gain experience and then transfer to higher activity air traffic facilities out of state, creating a higher than average turnover of controllers. Nationally, the firing of air traffic controllers several years ago has left some towers operating under their full capacity. The future outlook depends upon replacement of those who leave the occupation, expansion of "smaller" airports serving small cities, expansion of control areas around airports, and upon greater use of new, automated control equipment.

Air traffic controllers coordinate the flights of aircraft to prevent accidents and delays in taking off and landing. Controllers use two-way radios to issue clearances, give traffic information, and monitor electronic landing and navigational aids and all airport lights.

In Wyoming, there are around 80 air traffic controllers employed. Around 35 percent are employed as tower controllers and the remainder work as flight service station controllers. Average entry-level wage for a controller is around $17,140 per year. Journeyworker controllers earn about $25,365 per year. Maximum wages range from $30,000-$38,000 per year after five to 10 years on the job. In addition, controllers receive extra pay for weekend, night, and holiday work.

Because people entering government service as air traffic controllers do so at varied levels of experience--from having none at all to being fully qualified military air traffic controllers--it is difficult to make any hard-and-fast statements about training patterns. Most applicants apply to federal job information and testing centers and receive an appropriate government service (GS) rating based on test scores, experience, and education and training in relation to the job requirements. However, applicants who have previously or are now serving on permanent appointment within the federal service, or who are recently (less than one year) discharged veterans and have no more than 14 years of education, can apply directly to the FAA for the predevelopmental air traffic control program. In addition, the FAA also sponsors a co-op program for college juniors who are U.S. citizens and full-time students with a 2.0 GPA. Upon completion of school, students can be converted to permanent status with the FAA.

Applicants must pass both a written apititude test to evaluate abilities needed in air traffic control work and a rigid physical exam. After being accepted into government service as an air traffic control specialist, training usually consists of study at the FAA academy in Oklahoma City, Oklahoma, followed by a combination of on-the-job and classroom training at the facility where the recruit is assigned. After meeting all training requirements, the person is certified and given a control tower operator certificate. Advancement to journeyworker controller takes one to five years, depending on the facility.

Jewelers

In Wyoming, the outlook for jewelers depends on the demand for jewelry by customers, improvement in the nation's economy, and the availability of training opportunities. Because of the highly specialized skill required in creating and making jewelry, and the amount of training involved in learning this craft, this occupation has experienced a shortage of applicants. In addition, sources report that there is room for a statewide jewelry tradeshop (wholesale). Presently, jewelry store owners who do not employ a "bench jeweler" (who actually sets stones or does repair work) send repair work out of state. The creation of a statewide jewelry tradeshop would help eliminate the out-of-state cost to the jewelry store owner and create employment opportunities for qualified custom jewelry artists within the state. At the same time, however, due to the state of the economy and high unemployment, the amount of money available for luxury items has decreased, resulting in reduced employment opportunities.

Jewelers make and repair various jewelry articles such as rings, bracelets, necklaces, and watches for customers. Many specialize in fields such as diamond setting, engraving, and watch repair. Others may, after years of experience, become all-round jewelers. Some jewelers work in their own stores where they sell jewelry, silverware, china, and glassware.

Most employers require experience and/or postsecondary training when hiring. Retail stores prefer applicants who are able to deal with the public.

Wages vary with the employer, location, specialty, and level of skill. Trainees start between $3.35-$4.25 per hour. Experienced jewelers can earn from $5.00-$7.50 per hour. Jewelers who own their store or who work on a commission basis earn more.

Most jewelers learn their skills informally on the job, through a formal apprenticeship program, or at vocational schools out of state. Vocational schools offer training lasting from six months to three years. An additional three years of supervised on-the-job training to refine their skills is usually necessary. In Wyoming, contact the Bureau of Apprenticeship and Training at P.O. Box 1126, Cheyenne, Wyoming 82001, phone: (307)772-2448, for information on apprenticeship opportunities for jewelers.

For further information, contact Diane Latos, Wyoming Career Information System, Box 3808, University Station, Laramie, Wyoming 82071, (307)766-6189.

Diane M. Latos, Wyoming Career Information System

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Wyoming Coincident Indicators Index

The Wyoming economy turned slightly upward during third quarter 1984, according to the Wyoming Coincident Indicators Index (WCII).

The WCII, computed by the Division of Research and Statistics, Department of Administration and Fiscal Control (DAFC) is derived using economic variables whose movements generally coincide with movements in the overall economy. It is a composite index which uses four economic variables: (1) Wyoming total sales and use tax collections; (2) Wyoming state total insured wages paid in 1972 dollars; (3) Wyoming state total employment; and (4) an industry index comprised of one economic variable from each of Wyoming's three major industries. The three industries are agriculture, mining, and tourism, and the respective variables are: (1) prices received by Wyoming farmers and ranchers for all commodities; (2) Wyoming drilling rig count; and (3) Wyoming motor fuel gallonage sales. The historical period over which the index is calculated is January 1972 to June 1984.

Presented on the accompanying graph are the plots for three time series, one for the index using seasonally adjusted data, one for the index using data which has not been seasonally adjusted, and one for the U.S. Coincident Indicator Index. The unadjusted index is presented to show the seasonality of the Wyoming economy. The U.S. index is shown in order that it might be compared to the Wyoming index. The more important Wyoming index, and the one with which all further analysis and description will be concerned, is the seasonally adjusted index. In this index, turns up and down are caused by factors other than seasonality. The base month is January 1972, which has an index value of 100. An index value doesn't have any meaning in and of itself but is valid only when compared to another value from the same index.

The seasonally adjusted index registered 2.84 index points, or 1.95 percent lower in July than in June of 1984. August showed a gain of .87 index points, or .6 percent over July, and September increased by .72 index points, or .5 percent over August. This can hardly be interpreted as a strong upturn, but nevertheless, it is an upturn.

The decrease from June to July can be attributed to drops in wages, employment, and sales and use tax collections over the same period, even though agricultural prices, motor fuels sales, and rig count were up from June to July. Because the latter three variables are combined into one industry index variable, combined they have no more weight than any one of the former three variables. Thus, the decrease in wages, employment, and sales and use tax collections overwhelmed the increases in the industry index variables.

From July to August there were slight increases in variables across the board, thus a slight increase in the seasonally adjusted index from July to August. Increases in wages, tax collections, and agricultural prices outweighed decreases in employment, motor fuel sales, and the rig count from August to September, resulting in an increase in the seasonally adjusted index in September.

The unadjusted data resulted in an index which climbs from June to August and then takes a slight downturn in September. However, the unadjusted data is promising in that almost all variables are at levels that are greater than last year, indicating positive growth in that respect. Motor fuels sales was the only variable which registered a decrease from last year's data.

While the seasonally adjusted index has shown an upturn, it cannot be considered a strong upturn. The data is still very jumpy and does not show a strong, consistent movement from one month to the next. This holds for all variables except agricultural prices, which did show consistent improvement throughout the quarter. Because no strong, consistent pattern can be determined in any of the data, the upturn in the index is best interpreted as positive but tentative growth.

Steve Sommers, DAFC

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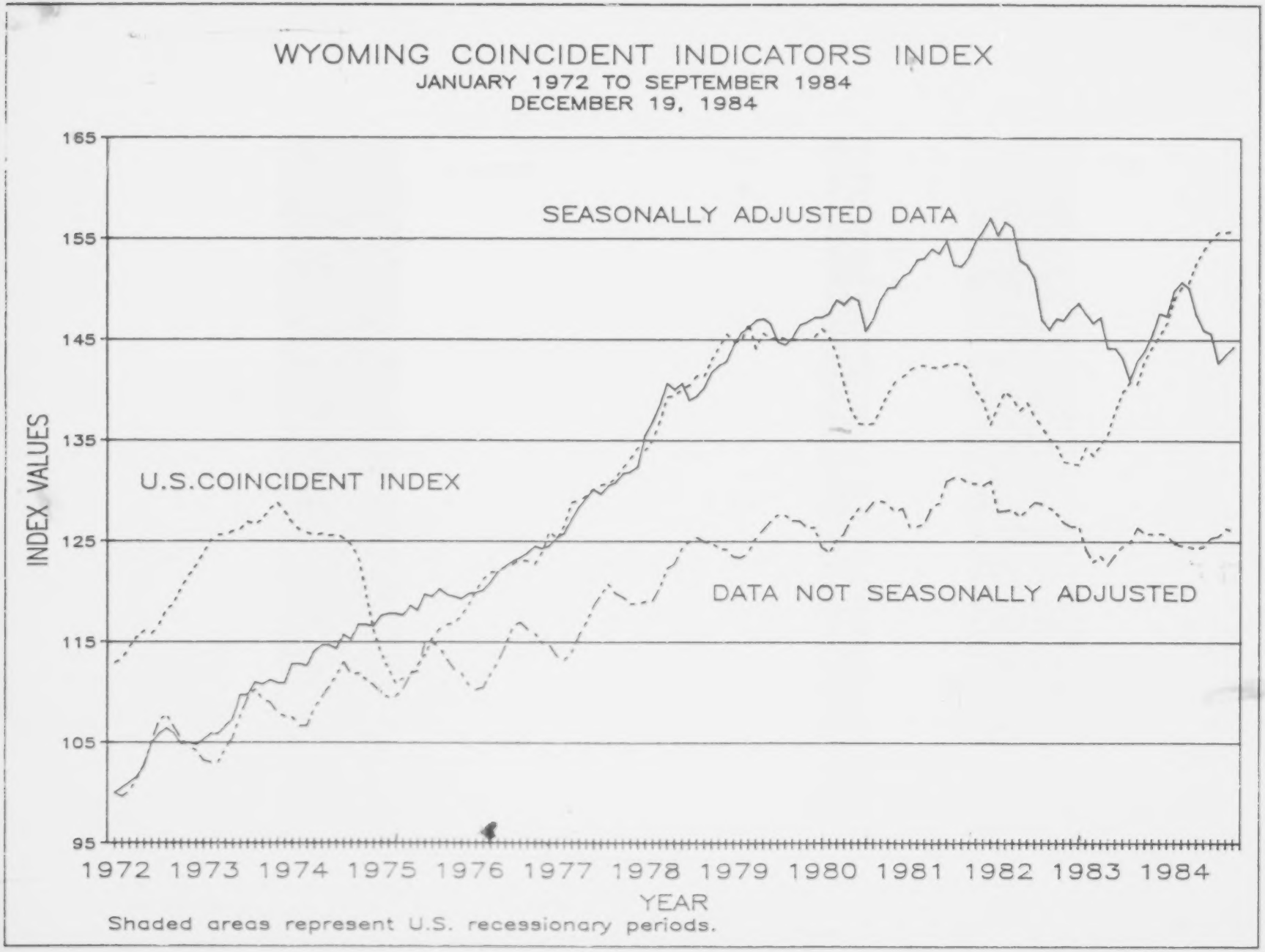

WYOMING COINCIDENT INDICATORS INDEX
JANUARY 1972 TO SEPTEMBER 1984
DECEMBER 19, 1984
INDEX VALUES
165
155
145
135
125
115
105
95
SEASONALLY ADJUSTED DATA
U.S.COINCIDENT INDEX
DATA NOT SEASONALLY ADJUSTED
1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984
YEAR
Shaded areas represent U.S. recessionary periods.

INDUSTRY PROFILE

A Wyoming Cattle Review

Since before statehood, agriculture in Wyoming has been dominated by the production of livestock. Between 1977 and 1983, the production of livestock and livestock products accounted for approximately 81 percent of gross cash receipts received by Wyoming farm and ranch operations, the largest portion of which was derived from cattle production. The production of cattle and calves historically has been, and today continues to be, the single largest source of agricultural income in the state.

Perhaps nothing has engendered more romantic notions about the American West than the men and beasts of the cattle industry. The long trail drives of the 1870s, the cowboys and their hardships, the gunfighter and the cowtown saloon, are the stuff of myth and legend. Cattle and cowboys have become so commonly associated with Wyoming and the West that it is easily forgotten cattle are not an indigenous species anywhere in the whole of the Western Hemisphere.

Cattle apparently were first introduced in the Americas 29 years after Columbus discovered the New World. In 1521, Hernando Cortez brought ashore six Andalusian heifers and one bull at Veracruz.

By 1540, the descendents of the first arrivals had been introduced in Texas. Thus, the cattle industry in the Southwest was already established 80 years before the Pilgrims landed at Plymouth Rock and 236 years before the Declaration of Independence.

In view of Wyoming's geographical location, it is curious that the first cattle brought into the state were of English rather than Spanish breeding, and were shipped from the East rather than the Southwest. In 1830, a party of mountain men led by William Sublette brought three beef cattle and a milk cow to the fur traders' rendezvous on the Wind River in what today is Fremont County. Following Sublette's lead, Robert Campbell, a member of the Rocky Mountain Fur Company, took four cows and two bulls with his expedition from St. Louis to the rendezvous on the Green River. These early cattle, however, did not remain in the state and thus cannot be considered the predecessors of today's cattle industry.

During the 1840s, Wyoming served as little more than an arduous transit stage for most of the emigrants headed to California and Oregon along the Oregon and Overland trails. Most of the people who remained were either stationed at military posts or operated way stations, called "road ranches," that served the needs of the westward-bound emigrants. At such stations, emigrants sold or traded worn draft animals for fresh stock. Small herds of cattle developed at many stations, although station keepers purchased such animals to put them in shape for the emigrant trade rather than to build up a local cattle industry.

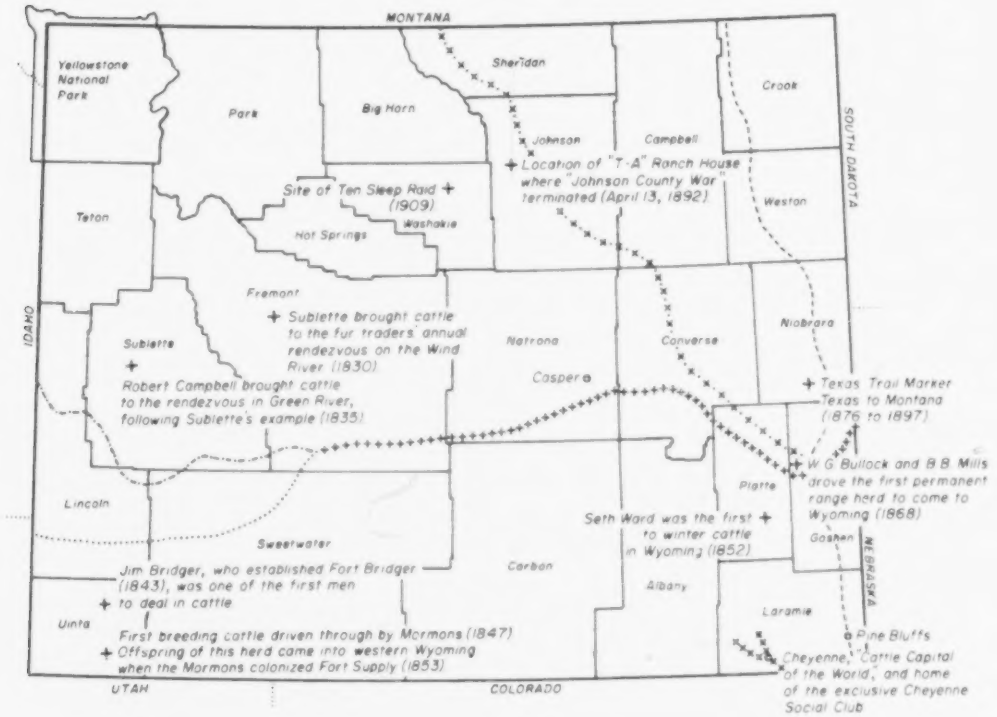
Among the first true breeding cattle to be brought into the state were those driven through in 1847 by Mormon emigrants. These Durham and Devon cattle soon became common throughout Utah, and undoubtedly, offspring from these herds were introduced in western Wyoming in 1853, when Mormon emigrants colonized Camp Supply south of Fort Bridger.

It is generally accepted that Seth Ward was the first person to winter a herd of cattle in what is now Wyoming, when as early as 1852 Ward wintered a herd of several hundred head along Chugwater Creek in southeastern Wyoming. The circumstances which led Ward to winter his herd are obscure, but they are probably similar to those which led stage operator and freighter Alexander Majors to repeat the experiment.

Engaged in hauling a large consignment of supplies to government outposts, Majors found himself confined to Fort Laramie by the onset of winter. With no alternative, Majors was forced to turn his cattle out to graze on the bottomlands adjacent to Chugwater Creek, just as Ward had done. Majors anticipated that few of his herd would survive. However, when the cattle were rounded up the following spring, Majors found their condition to be better than when they were turned loose, with virtually no losses.

The great boom in the western range cattle business began after the Civil War, when longhorns from Texas streamed north to railheads at Wichita, Abilene, Hayes City, Dodge City, Ogallala, and elsewhere. If cattle shippers weren't satisfied with the railhead markets, or if there was no market, cattle were

HISTORICAL MAP OF THE CATTLE INDUSTRY IN WYOMING


MONTANA
Yellowstone National Park
Park
Big Horn
Sheridan
Crook
SOUTH DAKOTA
Johnson
Campbell
Location of "T-A" Ranch House where "Johnson County War" terminated (April 13, 1892)
Site of Ten Sleep Raid (1909)
Washakie
Weston
Teton
Hot Springs
Fremont
Sublette brought cattle to the fur traders' annual rendezvous on the Wind River (1830)
IDAHO
Sublette
Natrona
Converse
Niobrara
Robert Campbell brought cattle to the rendezvous in Green River, following Sublette's example (1835)
Casper
Texas Trail Marker Texas to Montana (1876 to 1897)
W.G. Bullock and B.B. Mills drove the first permanent range herd to come to Wyoming (1868)
Platte
Lincoln
Seth Ward was the first to winter cattle in Wyoming (1852)
Goshen
NEBRASKA
Sweetwater
Jim Bridger, who established Fort Bridger (1843), was one of the first men to deal in cattle
Carbon
Albany
Laramie
Uinta
First breeding cattle driven through by Mormons (1847)
Offspring of this herd came into western Wyoming when the Mormons colonized Fort Supply (1853)
Pine Bluffs
Cheyenne, "Cattle Capital of the World," and home of the exclusive Cheyenne Social Club
UTAH
COLORADO

Cattle Trails:

--------- Texas Trail

xxxxxxxx Goodnight (Chisum) Trail

x-x-x-x-x-x Bozeman Trail

..... Lower Cattle Trail from Oregon

---------- Lander Cut Off from Ft. Hall, Idaho

+++++++ Continuation of the Oregon Cattle Trail

Sources:

Rollinson, John K. Wyoming Cattle Trails, Caxton Printers (1948), p. 323.

Worcester, Don. The Chisholm Trail, University of Nebraska Press (1980), p. xix.

Wyoming Highway Commission, State Highway Map.

frequently driven further north in search of buyers at other railheads. Although the movement of Texas cattle in the late 1860s largely was devoted to stocking the rangelands of Kansas, Nebraska, and eastern Colorado, some found their way into Wyoming as early as 1866.

The year 1866 witnessed what has been described as "one of the most remarkable cattle drives on record," when Nelson Story drove 1,000 head of mixed cattle up from Texas to Wyoming, entering the state at Pine Bluffs. Heading north by west, Story drove the first trail herd ever to enter the state.

In February 1868, a second Texas herd was pushed across the Wyoming border by J.W. Iliff, a successful Colorado cattleman, who brought the herd to the Cheyenne area for sale to local butchers.

The herds of Texas longhorns trailed through by Story and Iliff were among many herds pushed northward from Texas after the Civil War as cattlemen searched for markets and for new grazing lands. These longhorns were the forerunners for hundreds of thousands of other cattle that later would roam the high plains and mountain valleys of Wyoming and Montana.

The first permanent range herd in Wyoming arrived in October 1868, the property of W.G. Bullock and B.B. Mills of Fort Laramie. Early in the summer of 1868, Mills traveled to Kansas, Iowa, and Missouri, where he purchased 250 cows and one or two bulls. He then drove the cattle to a point on the Laramie River about six miles from Fort Laramie. According to John Hunton, who bought a share of the herd upon Mills' death in 1871, Indians laid such devastation to the herd for the first two years that it became necessary to move the cattle to a spot at the confluence of Richard Creek and Chugwater Creek, where a camp with three cowboys was established. The camp was later moved to the immediate vicinity of the Hunton Ranch at

Bordeaux.

Another early cattle venture was the partnership of Ecoffey, Cuny & Richard. In the fall of 1871, the partnership brought a herd of 600 Texas cattle to what is now Platte County, establishing a campsite which later was incorporated in the headquarters ranch of the Swan Land and Cattle Company.

During the same period, Levy Powell established a herd of 2,000 Texas cattle on the North Laramie River. Powell intended to drive the herd north during the following summer, but Indians attacked before he could depart. The Powell herd was then sold to F.M. Phillips, who established a ranch at the confluence of Chugwater Creek and the Laramie River. Following such early ventures, small herds were established with some regularity in southeastern Wyoming.

The coming of the Union Pacific Railroad provided impetus to growth in the Wyoming cattle industry, by providing both a market and a transportation to market. Favorable weather, with the exception of the winter of 1871, also blessed the cattle industry in its infancy. For the most part, the first cattlemen were small operators; the reign of the cattle baron was yet to come.

The vast Wyoming rangelands of the early 1870s had barely been penetrated. William Francis Hooker, who arrived in Wyoming in 1873 at the age of 16, left the following account: "In 1874," he wrote, "there wasn't a ranch between Fort Laramie and Fort Fetterman. Neither was there a ranch between Fetterman and Medicine Bow on the Medicine Bow Trail."

The plains of southeastern Wyoming began to fill up first. "...Scutheastern Wyoming was the small end of the cornucopia," wrote John Rolfe Burroughs in Guardian of the Grasslands, "which eventually spewed cattle over the rest of the state." But even as late as 1878, there was not a cattle herd anywhere in the Big Horn Basin, and because of a treaty with the Sioux, cattlemen were unable to take herds into the Powder River country until after 1876.

In 1870, the first trainload of cattle was shipped east out of Wyoming. The cattle, consigned to agents of the French government, were loaded on a Union Pacific freight at Cheyenne, destined for use by French troops fighting in the Franco-Prussian War. H.B. Kelley, owner of the stock, was paid $70.00 per head.

Railroad cattle shipments increased throughout the 1870s. In 1873, 286 carloads of cattle were shipped; by 1877, that number had increased to 1,694. By 1881, more cattle were shipped from the Union Pacific's Pine Bluffs station alone than had been shipped from the entire state in 1877.

The cattle drive occupies a unique place in the history and romanticism of the American West, and thus deserves special attention. While the first Texas cattle drives to the Northern Great Plains did not really commence until about 1866, drives from the Southwest to other parts of the country had already started some 20 years earlier. The first Texas cattle driven to market were sold in New Orleans in the early 1840s. By 1846, feeder cattle from Texas could be found in many states of the Midwest. In the late 1840s and early 1850s, Texas cattle were driven to California, in response to demand created by the California Gold Rush. When the Civil War began, Texans supplied cattle to the Confederacy. This market was choked off in 1863, however, by the successes of the Union armies.

The early cattle drives could be a peculiarly risky business. Quite often, a cattleman pointed a herd out of Texas without having the slightest notion where or to whom the cattle might be sold.

By the late 1870s, cattle were pouring into Wyoming. In addition to thousands of longhorns trailed slowly up the Chisholm and Goodnight-Loving trails from Texas, other (and often better bred) cattle were coming in from Oregon, Idaho, Utah, and states of the Midwest. Cattle from the Far West were known as "westerns" or "Oregon natives;" cattle from Iowa, Indiana, or Ohio were called "Americans" or "states;" and those bred in Wyoming were called "natives," to distinguish them from Texas longhorns.

Although Texas longhorns came to Wyoming via many routes, one of the most common was over the Texas Trail. The Texas Trail entered the Wyoming Territory at Pine Bluffs, crossed Horse Creek and veered north to a crossing on the North Platte River near the mouth of Raw Hide Creek. From there, the trail detoured to a crossing on the Belle Fourche River. The trail

Table 4: All Cattle and Calves on Wyoming Farms and Ranches by County 1979-1984 (Number of Head).

Counties	1979	1980	1981	1982	1983[1]	1984[2]
Albany	51,000	50,000	51,000	55,000	66,000	67,000
Big Horn	51,000	52,000	51,000	54,000	53,000	50,000
Campbell	72,000	73,000	73,000	73,000	72,000	70,000
Carbon	96,000	91,000	93,000	93,000	104,000	101,000
Converse	65,000	63,000	64,000	65,000	75,000	76,000
Crook	65,000	62,000	58,000	61,000	74,000	72,000
Fremont	79,000	81,000	84,000	87,000	96,000	89,000
Goshen	101,000	101,000	110,000	108,000	106,000	106,000
Hot Springs	39,000	40,000	41,000	43,000	44,000	38,000
Johnson	70,000	66,000	62,000	63,000	56,000	53,000
Laramie	60,000	58,000	61,000	60,000	69,000	65,000
Lincoln	33,000	34,000	29,000	28,000	50,000	42,000
Natrona	55,000	53,000	51,000	55,000	54,000	51,000
Niobrara	69,000	65,000	66,000	67,000	55,000	56,000
Park	74,000	72,000	80,000	89,000	97,000	87,000
Platte	90,000	84,000	81,000	85,000	78,000	71,000
Sheridan	82,000	80,000	79,000	82,000	83,000	75,000
Sublette	69,000	66,000	62,000	67,000	67,000	61,000
Sweetwater	21,000	18,000	18,000	19,000	20,000	18,000
Teton	17,000	15,000	15,000	15,000	15,000	14,000
Uinta	35,000	31,000	36,000	37,000	40,000	38,000
Washakie	37,000	38,000	36,000	37,000	45,000	46,000
Weston	49,000	47,000	49,000	47,000	56,000	49,000
State	1,380,000	1,340,000	1,350,000	1,390,000	1,475,000	1,395,000

[1]Revised
[2]Preliminary
Source: Wyoming Crop & Livestock Reporting Service, Wyoming Agricultural Statistics, 1984.

then spread fan-like to the Dakotas, Indian agencies, northern Wyoming, into Montana, and north to the Canadian border.

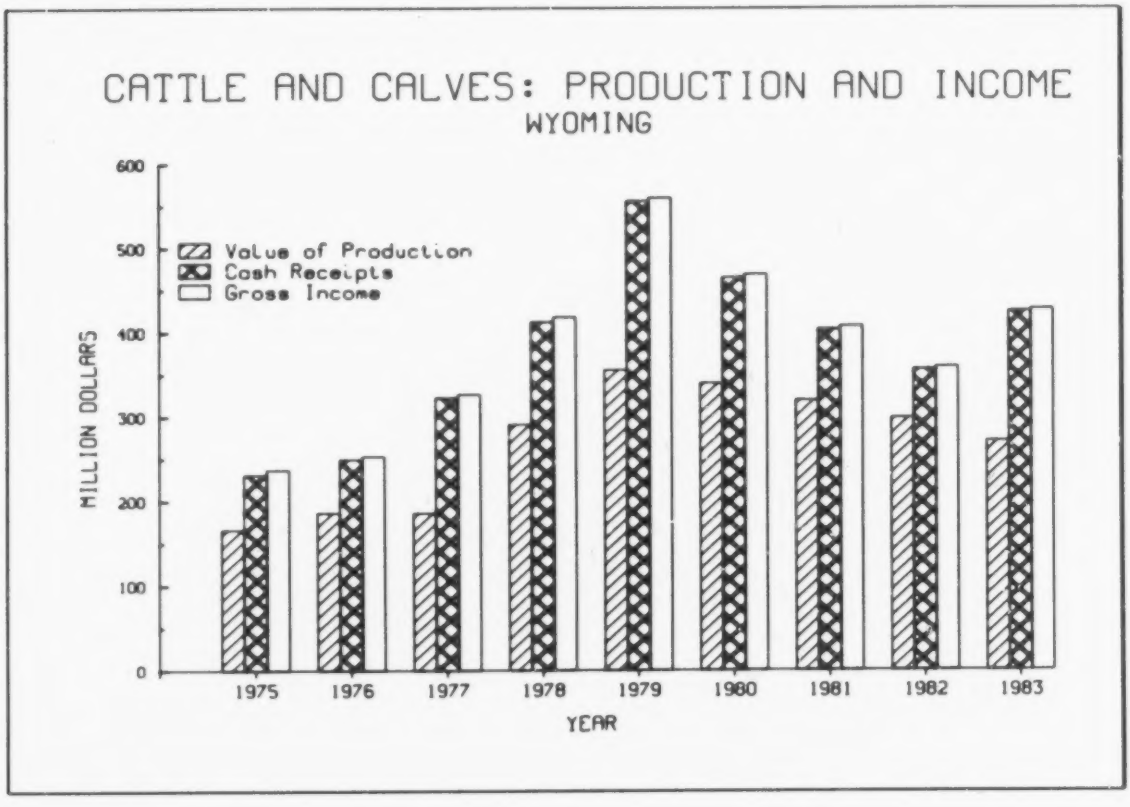
Most of the cattle drives that originated in Oregon entered Wyoming near Star Valley, crossed the mountains, followed the Sweetwater River, then branched out to various points in the region.

Two of the first large herds from Oregon reached Wyoming in 1876. One herd was trailed 1,600 miles from Dalles, Oregon, to Cheyenne, where it was shipped east. The second, which apparently originated in southeastern Oregon, was trailed through the state to Ogallala, Nebraska, for shipment.

By 1877, some estimates claim 50,000 "Oregon natives" were enroute from Oregon to Wyoming. In 1878, the number of Oregon cattle bound for Wyoming and Colorado had reached 100,000, according to one estimate.

John B. Kendrick, an early cattleman in northern Wyoming, left an account regarding the organization and daily work along the trail:

> "The Trail resembled...a great river with many branches and tributaries. Side trails led in and out in all directions. Cattle included all ages and kinds except calves, which were either given away or destroyed to avoid delaying the herd...As a rule the size of the herd was about 3,000 head; 3,500 was known as a large herd.
>
> "The ordinary outfit with a herd consisted of the foreman, cook, horse wrangler, and from seven to eight cowboys; a mess wagon drawn by four horses or mules, and a band of about fifty saddle horses. The owner furnished the horses but the saddles and bedding were supplied by the cowboys...We started by branding. At that time we roped and threw the cattle almost entirely on foot (in order to spare our horse for work on the trail). The roping was very hard on horses, and extremely dangerous because of the viciousness of the cattle. It was less difficult for a man to dodge and escape fighting cattle (on foot) than for a horse. Employers thought best to use men and hire extra help, than to risk the horses. Men were cheaper than horses. Our best help were Negroes and Mexicans, who were the most proficient ropers on foot I have ever known. The cattle were thrown by roping them by the front feet.
>
> "When our herd was complete, we started on our travels...We averaged about fifteen or twenty miles a day. The men were divided into two reliefs in the daytime, and four reliefs of night guards. The last guard in the



morning called the cook, and turned the cattle from the bed ground to graze. When breakfast was finished, the foreman would go ahead, followed by the cook wagon, and locate water for the noon site. After the discipline of a few days on the trail, the cattle would march like soldiers following their natural leaders. If possible, they were not allowed to take one step except in the direction of their destination. In this way, they would often cover two or three miles while grazing in the morning, and again in the evening...

"The vicissitudes of the trip were many, including long drives across barren country with a shortage of grass and water. Whole herds of cattle were known to go blind after suffering intense thirst for several days...During the frequent electrical storms at night, instead of being 'off and on' relief, we were 'on and on' to hold the frightened herd together and prevent stampeding. The only thing visible was electricity on the points of our horses' ears, and lightning crawling along the ground. More than once I have seen cattle killed within thirty feet of me. When the cattle did stampede and break away, we would gallop with them in the darkness and try to turn them to mill in a circle. I do not recall a single instance when, without rest for twenty-four hours, we did not start on the trail next day intent on making our usual twenty miles.." (from John Rolfe Burroughs' Guardian of the Grasslands, p. 31-32).

The glory days of the cattle drive, however, were short lived, lasting scarcely 30 years. As early as 1883, Thomas Sturgis, secretary of the Wyoming Stock Growers Association, reported to the convention's membership that "the drives from the West (Oregon) have ceased, and those from Texas have greatly diminished." The last trail drive of any consequence may have occurred in Wyoming in 1897, when an XIT trail herd from Texas made a final long trek.

The period between 1880-1887 marked a booming era in the western range cattle industry. Pioneer stockmen sold their holdings at handsome profits and moved on in search of new rangelands. Large corporations were formed with both American and foreign capital.

Newspapers and magazines proclaimed Wyoming's wealth in natural resources. "As cattle country," one account read, "Wyoming has no equal in the United States, the plains and hills being covered by herds..." With the proliferation of publicity about the "big bonanza," where free valleys with rushing mountain streams could be had for the taking, hundreds of additional settlers headed for the high plains.

The general influx included wealthy investors, who enjoyed the prestige of owning huge herds and controlling vast tracts of land. A by-product of the influx of wealthy and educated men from the East and the British Isles was establishment of the exclusive Cheyenne Club. The Cheyenne Club was a men's social club patterned after eastern establishments. Organized primarily for social purposes, it also served as an impromptu livestock and real estate exchange.

By 1880, Cheyenne had developed into the cattle capital of the world. It was the great meeting place of southern trail drives and northern cattlemen. It was also reputed to be the wealthiest city per capita in the world.

Among the cattle kings of Wyoming was Alexander Swan, who began ranching in 1873 with his partner, Joseph Frank. Together, the partners controlled thousands of cattle on a vast range stretching from near Ogallala, Nebraska, to Fort Steele, Wyoming, and from the Union Pacific Railroad to the North Platte River. The principal Swan range, however, extended from Chugwater and Sybille creeks westward over the mountains to the Laramie Plains.

Swan was a pioneer in upgrading the quality of cattle on the Wyoming range. In 1877, he began introducing Hereford bulls from Illinois and Iowa, and in 1883, he imported purebred Hereford cows and bulls from England.

In 1887, however, the powerful Swan failed, due to a combination of weather-related losses and generally loose management practices. When Swan failed, he carried a collection of investor associates and hangers-on with him. In 1888, John Clay was named manager of the Swan Company. Under Clay's management, the company recovered to an extent, but by 1910, it had sold its cattle and turned to raising sheep.

In 1887 the cattle boom collapsed, the result of drought, a severe winter, and generally overcrowded ranges. Many cattlemen of the northern and central plains were ruined by the winter of 1886-1887. Concerning the disastrous winter, Francis E. Warren, a powerful early stockman, wrote, "From all I hear, fully one-half the cattle in the Powder River country as well as from the Platte River, perished last winter. This arose from two causes: eaten out ranges and hard winter. A few years ago when I was conversant with the northern country from Fetterman to Montana line, everybody was throwing cattle north. The Powder River, Fort Fetterman, etc., had a reputation from Oregon to Texas and the consequence was the worst overstocked ranges probably in Wyoming.

"The past winter has done two things, in fact three," Warren continued, "reduced the number of cattle to a point where they will winter safely, frightened the whole country from driving cattle in there, and given a splendid growth of grass this year, which really renews the range."

The period between 1889 and 1892 in Wyoming marked a time of unrest on the high plains, culminating in the so-called "Cattlemen's Invasion" or "Johnson County War."

Many cattlemen felt peace officers were derelict in their responsibilities when it came to apprehending cattle rustlers. Partly, the laxness on the range was an unfortunate legacy of the absentee ownership prevalent during the cattle boom era. When an owner saw his cattle only once or twice each year, it was difficult to keep thieves from stealing them. A good many people, moreover, resented the rich outside owners, who they felt had never seen the tough side of life and had no lawful hold on the range.

Another source of the lawlessness was inherent in the origins of Wyoming's cattle business. John Clay commented that many cowboys who came up the Texas Trail during the early days were imbued with a compulsion for larceny. For many of them, stealing cattle was an established way of life. In addition, the seasonal character of a cowboy's work also probably contributed to the larceny. During slack times, for a man with the know-how and a good horse, it was a small step from rounding up maverick steers to outright theft.

The appearance of numerous settlers on the range also contributed to the general unrest. A fundamental conflict of interest between cattlemen and "nesters" developed, as settlers began fencing in land, creek bottoms, and water holes.

By 1891, cattlemen felt compelled to take some action. In 1892, a group of about 25 frustrated Wyoming cattlemen, along with an equal number of "deputies" recruited in Texas, headed north from Cheyenne and invaded Johnson County, bent on dealing out justice to some of the more notorious cattle thieves. Along the way, the cattlemen's force shot it out with Nate Champion and Nick Ray, killing both men in a log cabin. Word of the shootout spread rapidly, allowing an opposing force of 200 to 300 heavily armed men to organize behind Johnson County Sheriff "Red" Angus (who sympathized with the rustlers). This small "army" surrounded the cattlemen at the TA Ranch 18 miles south of Buffalo; it is probable that the cattlemen would have been wiped out if federal troops from Fort McKinney had not arrived in time to avert a battle. The troopers arrested the cattlemen and returned them to Cheyenne, where they were eventually released.

The Johnson County War was the last hurrah of the open range cattleman. The waves of settlers taking up claims on the dry bench lands ranched on relatively small units, rather than on free and open range. The free range operators either went broke or acquired acreages of their own. Gone as well were the giant open range herds. The number of cattle in Wyoming dropped from 900,000 in 1886 to 300,000 in 1895. Sheep also were populating the range in greater numbers. In Carbon County, for example, only 1,540 head of sheep were reported in 1879; by 1889, that number had swelled to 200,000.

By the turn of the century, cattle ranching was moving to a system based on smaller herds run on privately owned land. The large, open-range round-ups were coming to an end.

In the early 1900s, considerable tension developed between cattle and sheep operators, particularly over use of the public lands. In many areas, cattlemen drew imaginary "dead lines" over which sheep were not allowed to cross. In most cases, sheepmen respected these boundaries. However, in some cases when sheep strayed across these lines, herds were slaughtered, and in some instances, herders were shot and their sheep wagons destroyed. The feuding between cattlemen and sheepmen culminated in 1909. In the so-called "Ten Sleep Raid," two sheepmen and a herder were killed. Five cattlemen were sentenced to prison as a result.

During the same period, cattlemen feuded with the Forest Service over grazing fees, payments to states for timber sales, concessions, and leases. However, opposition gradually lessened as the range users and the Forest Service officials reached acceptable

agreements.

Cattle numbers in Wyoming have been on a roller coaster cycle of ups and downs during much of the twentieth century, as production has been cast about by the forces of nature and the marketplace. Cattle numbers in Wyoming increased after 1898, to 750,000 head, followed by sharp declines in 1910-1911, only to rise once more to 609,000 head by 1912. For the next seven years, cattle numbers increased sharply in response to new demand created by World War I, reaching a peak of 1,301,000 head by 1919. After 1919, cattle numbers slid once again, as producers adjusted to a post-World War I depression in prices and to a general oversupply of cattle. A hard winter further reduced total numbers. The downward trend continued until 1928, when 771,000 head were found in the state.

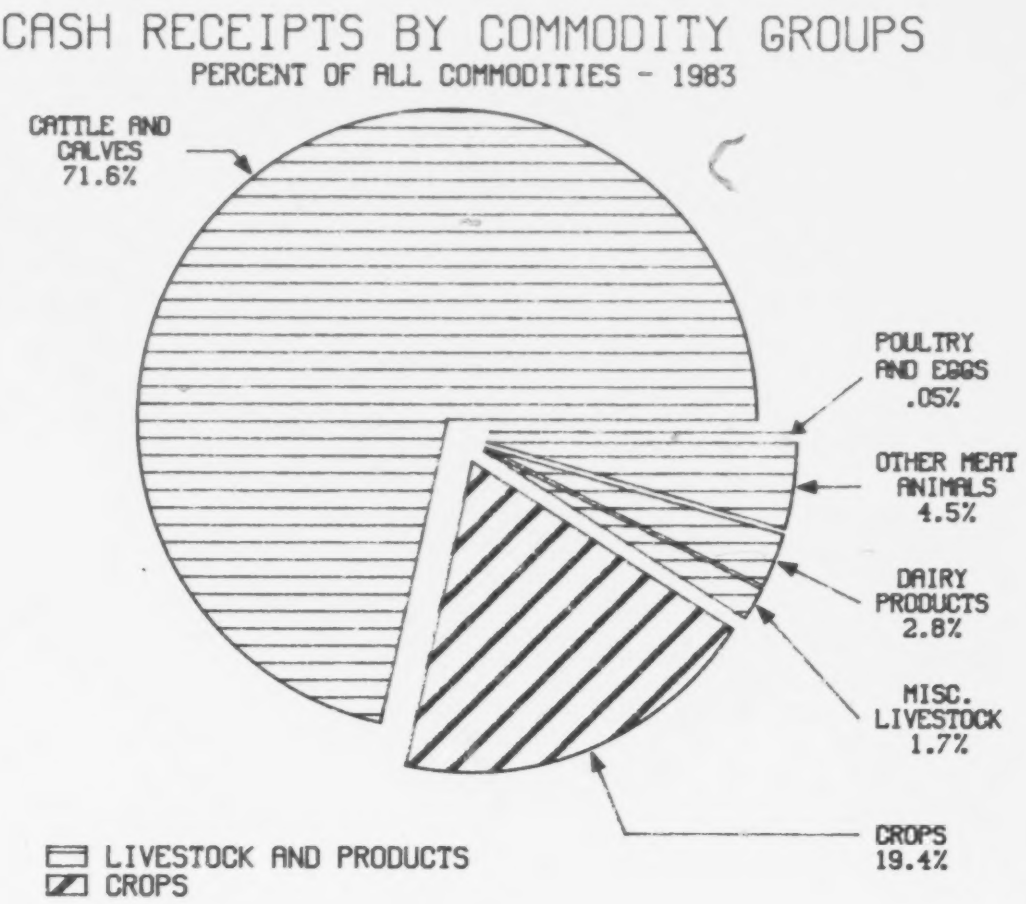
A similar erratic pattern emerged during the 1930s. In 1929, cattle numbers began to increase, reaching 1,050,000 head by 1934. Widespread drought in 1934, however, reduced cattle numbers by almost 19 percent. The cycle then began tracking upward again, until herds were built back to 1,178,000 by 1953, the third largest number of state cattle on record.

Milk cows, never very numerous in the state, peaked at 67,000 head by about 1940, after which their numbers slowly declined to about 20,000 by 1970. Dairy cattle, mostly Holsteins, were concentrated in the Star Valley of western Wyoming, and in Sheridan and Fremont counties.

A severe drought in 1954 precipitated a decline in the cattle cycle, but by 1960, numbers were back to pre-drought levels. Forage was in short supply during the fall of 1960, encouraging the sale of marketable beef at record-high levels. Improved feed and forage conditions in 1961 allowed for restocking, with steady growth in cattle numbers occurring from 1962 to 1975. Cattle numbers in 1975 reached a record-high of 1,690,000 head.

During 1975, however, the effects of a 1974 consumer beef boycott were being felt, resulting in a drop in cattle prices and cattle numbers. By 1980, cattle numbers had dipped to 1,340,000 head.

After 1980, cattle numbers recovered



strongly, reaching 1,475,000 head by 1983. During 1983, however, high feed costs resulting from drought and a prolonged cold spell caused a 5 percent reduction in cattle inventory, to 1,395,000 head.

In April 1984, the weather once again exacted a grim toll on livestock producers. A severe blizzard swept across Wyoming, Montana, and the Dakotas, resulting in the loss of nearly 400,000 sheep, and thousands of cattle and new-born calves. Heavy winds and snowfall during the three-day storm created 20-foot drifts and suffocated livestock seeking shelter. In addition to the losses suffered during the storm, numerous post-storm losses resulted from pneumonia and other diseases brought on by stress and lower resistance. The storm hit in the midst of calving season and was one of the most devastating in years. Eight northeastern Wyoming counties were declared national disaster areas.

The January 1, 1985 inventory of all cattle and calves on Wyoming farms and ranches was 1,365,000 head, down 2 percent from year-earlier figures. Cow numbers, at 630,000 head, were off by 50,000 head. Cattle and calves on feed for slaughter increased by two-thirds over 1984 levels, to 110,000 head. The total value of Wyoming's cattle and calves was $518,700,000.

As of January 1, 1984, Goshen County continued to rank first among all Wyoming counties in cattle and calf numbers, followed by Carbon and Fremont counties.

S.T. Mast and Ruth Tebbutt, IPR

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Industry Interview

Hard Times Befall State's Cattle Industry

(The following is excerpted from an interview with Bob Budd, executive vice president of the Wyoming Stock Growers Association. The interview, which was conducted in February, highlights some of the challenges faced by the state's cattle industry. Minor editing is included for the sake of clarity.)

WQU: How large is the cattle industry in Wyoming? How does it compare with other states?

Budd: We have about a million and a half head of cattle in the state over the period of a year. That includes the mother cows we have, which number about 600,000. Then we import between 200,000 and 500,000 head a year for summer pasture. Among the states, we're twenty-second in cattle production. Obviously, being the ninth largest state, and being twenty-second in production, points to the fact that we don't have the kind of rainfall or pasture production other states have. We also have a problem in that our land is only half privately owned. So what we can do, and how many cattle we can run on the public land, is limited by the federal agencies. Cattle and calves accounted for $424,361,000 worth of production last year. That's 72 percent of the total agricultural output of the state. Nationally, cattle and calves are also the biggest contributors to farm income.

WQU: What about the productivity of the land itself? How much acreage is required to run cattle in the state?

Budd: It varies. But 20 to 30 acres per head would cover most of it.

WQU: How does that compare to states like Florida or Tennessee?

Budd: No comparison. You take Florida or Missouri, they're probably two acres to a cow or two cows per acre. They're down close to a one-to-one ratio. But there is a little difference in the type of animals that we raise. Our cattle sell right at the top nationwide, if you take the average price for calves, the average price for steers. Wyoming cattle are in the top five every year. I'm not pointing a finger at any other state, but we have a hard grass type of prairie and high altitude. The cattle are more robust. They tend to gain well in the feedlot. They tend to be very healthy and they grow out well. Plus our producers are very aggressive, moreso than most states. I think that's true of the West. We produce beef cattle, and in many cases, that is all we can produce. If you go to the South, they raise oranges, and because they have grass growing between the trees, they buy some cows to eat the grass. To them, it's not their major livelihood. To the people of Wyoming, it is their major livelihood.

WQU: Are there many mixed operations in the state? How many are purely cattle and how many are some combination of cattle and sheep? And how many people of the total involved with ranching are involved fulltime, without outside employment?

Budd: I don't know that I can give you an exact figure. I can tell you in general. There are a lot that are cattle and sheep. There are a lot that are cattle and hay. Some are now going cattle and some farm crop, if they have that capability. More and more people are finding that they have to supplement the ranch income. In 1983, the indication from the U.S. Department of Agriculture was that we lost $62.2 million. It's just a necessity. If we're going to keep the family people in agriculture, they're going to have to find ways to supplement their income.

WQU: Has the number of people involved in cattle raising been declining?

Budd: It's been fairly steady. But the employment of non-family people is dropping, and I think it will continue to drop. Ranchers just can't afford the luxury of having four hired men. In a family situation, if they're trying to raise enough to provide for two or three families, then having hired men and providing for them just isn't possible.

WQU: Are large, corporate cattle operations becoming more plentiful?

Budd: There's more of it. Right now, it isn't occurring so much because the land values have started to come down.

WQU: Do you think such corporate ranching is a good thing? Does it affect productivity?

Budd: It doesn't have a great deal of effect on productivity. As far as being a good thing, I guess you have to realize that I come from the point of view that I want to see Wyoming

ranching remain in the hands of Wyoming people, who want to ranch and make a living that way.

WQU: For romantic or practical reasons?

Budd: Both. I think the whole state should look at that. If the Chairman of the Board of Frito Lay wants to own a ranch, he doesn't want to own that ranch so people in Rawlins can come out and hunt or fish. He might not even want to produce cattle. He wants to own it to have his private area of recluse. I think everybody needs to see that if ranches end up being bought out by Conoco or Frito Lay, they may not be buying those ranches to produce, to be a part of the community, or to allow other people to use that land, as historically Wyoming ranchers have done. Economically, it isn't going to change the tax base a great deal. But it's going to change a lot in the way whole counties operate, the political setup, the sociological setup, and everything else.

WQU: How is the market these days in terms of prices received?

Budd: The only way to look at it is to compare the Consumer Price Index and prices received. Since 1967, prices received have doubled. They are sitting at 200 percent of 1967. Your Consumer Price Index is 321 percent. So we've lost our rears. There's no other way of putting it. You can't go to 321 percent in your expenses and have your income stay at 200 percent and still survive.

WQU: That's been very apparent in the agriculture statistics in Wyoming the past couple of years . . .

Budd: The last three or four years have been worse than anything. Most of it is interest rates. You take a guy in a fairly small operation, who would borrow $200,000 a year. That's in operating money, not on his land. He has to borrow that at 15 percent. His interest bill is more than most people's salaries! His interest bill is $30,000. It's pretty tough to service $30,000 of interest debt with cows and calves, or sheep and lambs. I think that's the single biggest thing that's just killing agriculture.

WQU: Do they then mortgage the land to cover the difference?

Budd: That's the problem. Outfits that have been free and clear, or outfits that did not have a great deal of debt load, end up saying, well, it's the only way I can get the money to operate, to cover me, hoping the next year the market will go up. The only way to do that is to mortgage the land, or sell part of it off.

WQU: There also have been published accounts which indicate that the land values declined in 1983, basically for the first time since the 1930s.

Budd: I don't agree that's the first time it's gone down. It just finally showed up in the aggregate as going down, but it's been going down since 1979 or 1980 in many parts of the state. Somewhere amid the boom years of the mid-1970s, land values peaked out, held briefly and then started crashing, and that decline is starting to show up. Declines don't show up as quickly as the increases because the sellers aren't nearly so anxious to sell in a market that is bad. Now, some of the sales that are starting to color the value are sales where the seller had no other option. Obviously, land prices will have to come back someday, but the question right now is whether a guy can sit it out until that happens.

WQU: It sounds as though the industry is not very healthy at this point.

Budd: It's not. The last year that was good was 1979, and it wasn't terribly healthy. In that market where people were making money, they were getting $1 for calves and $.80 for yearlings. This year we're looking at $.62 to $.65. In order to put profitability back into the market across the board, it's got to get so that you can get yearlings back up to the $.70s and calves in the $.80s before anybody is going to make enough money to really do any good.

WQU: How are people staying in business?

Budd: They're eating their equity up. A lot of them are in business for five years under Chapter 11. A few of them never borrowed any money, and they just keep cutting back and cutting back and cutting back. Lots of them are finding they have to go to alternate sources of income. The hardest problem that I have in trying to tell someone why agriculture is in trouble, is that they'll say, well I just saw Joe Bones and he's headed for Arizona. Joe Bones made his money and paid his ranch off in the 1940s. He made some money, and he was a smart investor. Now he has retired. He's no different than the banker who goes down to Arizona and retires. But he's probably got a son and a daughter-in-law, and maybe some grandkids, who are trying to make a payment on that place at 12 or 15 percent, and they're losing their butt. They aren't going to Arizona. Somebody is staying here in the winter. And that's the guy who is here now. And that's they guy who is in trouble.

WQU: How do you get into the ranching business these days?

Budd: What's the old saying? "By the grave, by the altar?" For a young person to get in, I guess the answer is that they can't. I can't go out and buy a ranch. Number one, you can't just buy something straight out and show enough cash flow at this point that the banks will give you a loan. Number two, the financing is so high, you can't service your land debt and your yearly debt on your cattle and show that it will work. A lot of it is by transfer. A lot of it stays in families. There are some people who can buy land, most of whom are not ranchers. Some are. Some come out because they've had it with Chicago's traffic. Those people are welcomed because they really believe in what they're doing. Some think that land is a good buy. They say, yes, we will take a loss in agriculture and cattle. We'll sell our

cattle for whatever we can get. We'll take that loss and write if off in five years. Then maybe we will sell all the cattle and hold the land. Who could care less about where the industry goes? It's strictly a business decision. I guess I have to respect them for that. But they are not the rancher everyone keeps saying we want to help keep in agriculture.

WQU: What do you see in the outlook for the cattle industry over the next few years?

Budd: I think the markets are going to pick up some. I hope the market will be stronger this fall. I think more people are going to diversify. They're going to do what they did in the 1930s. Everybody talks about recession. For agriculture, it has been a depression. They're going to use more family labor. They're going to live frugally. They might get into other crops. They're going to sell at more times of the year, extend their marketing season to extend their cash flow. They may go into business outfitting or charging access fees for hunting or fishing. Some of them are going to sell firewood. Some of them are going to rent out part of their farm ground and let someone else who owns machinery take the risk of farming so they don't have the overhead of a $70,000 tractor pulling a $40,000 corn cutter.

Hopefully, the state, the federal government, and the banks are going to realize that agriculture can't operate in the same interest picture as some other businesses. They have no cash flow, and the inventory can't be held. You can take shoes or widgets and have a sale if you get into trouble. You can discount your inventory 10 percent, have a sale, and make your payments. You can play with your inventory, double it, cut it in half, keep less inventory on hand. A rancher can't do that. His inventory is walking and eating. He can't raise his inventory. He can't just buy twice as many cows. The land resources won't support them.

I do think people are going to get better at marketing in the next few years. They're going to look at extended seasons to generate more cash flow. They're going to look at retained ownership. The guy in Wyoming who doesn't grow feed is going to put them in a feedlot and pay to feed at times. More and more people are doing that.

WQU: Feedlots and packing plant operations haven't been particularly successful in Wyoming. Why?

Budd: Transportation and demand. In Wyoming, we have a great transportation system. We have two major interstates, running north and south, east and west, and two big railroads. We have the arteries. But a rancher, say in Douglas, has 500 steers. And you build a feedlot. You could have sent your steers somewhere to be fed, and sold them, and been done. Now, with the feedlot, you are going to take on the added risk of hauling in your feed from Kansas or Iowa. So either way, you are going to pay the freight. In Wyoming, you can't grow the quantity of corn, oats, milo, whatever, that you need.

I think you are going to see a big feedlot area built in western Nebraska and eastern Wyoming. Those people have the capacity to raise crops to feed livestock. They have an excellent market center there. That will be healthy for all of Wyoming's industry. As far as a packing plant goes, the biggest limiting factor is cattle supplies. We are a first line production state. We produce range cattle, the best in the country. But as far as whether or not we could go all the way through to a finished product, I'm talking about a million cattle a year. At this point, interest rates and transportation costs make that prohibitive. For instance, Colorado, with Denver, has a big advantage over us. Any place with a metropolitan area, where they don't have to freight the finished beef long distances, has an advantage over us.

I guess in summary, you asked about the industry in Wyoming today. The industry is in trouble, and it's in trouble for a lot of reasons beyond the limitations of individual management. (Federal Budget Director) David Stockman likes to say that everyone in trouble has overextended and has been a poor manager. Well, that is just not true. Interest rates, number one, have eaten agriculture alive. Markets have not helped, and costs of production have gobbled up a lot. A good example of the double squeeze there is the federal rate for grazing. Last year, the rate went down because the markets were off for the fourth year in a row, and this year, the rate went down again because the costs of production went up. If one don't get you, the other will.

The part of all this that should concern every man, woman and child in Wyoming is twofold. First of all, and this should concern everyone in this country, agriculture is the bulk of our Gross National Product, and that industry is in trouble. We had better look at what happens if that industry falls on its nose, because as goes agriculture, so goes the fate of the economy. The second thing goes back to your question of romantic notions of leaving Wyoming ranching in the hands of Wyoming ranchers. While this industry doesn't carry the bulk of the tax load, or rank as the top industry in the state, it is so important to the stability of many, many communities. Casper may survive, but what will happen to towns like Newcastle and Douglas and Lander and Kemmerer and Worland and Riverton and Sheridan? There is a lot more at stake here than just several thousand ranchers. What we have at stake is a way of life for all of us, our local economic picture, and one hell of a lot of what makes tourists come out here in the first place. We have Wyoming in our hands here, and everything is swinging in the balance.

S.T. Mast, IPR

# #

Frugality

Rancher Turns Cattle Profit by Borrowing No Money, Living within Means

Unlike many Wyoming ranching operations, A.H. LeBeau & Sons of McFadden show a profit on cattle every year. The deeded ground of the ranching enterprise is not encumbered by mortgages. The cattle pay their own way.

Which is not to say, as Gerald LeBeau is quick to point out, that times in the cattle business are good. But if the LeBeau family has not developed a strategy for getting rich in today's market, at least it has found a way to survive.

The A.H. LeBeau & Sons corporation actually comprises four ranches in Albany and Carbon counties, plus a farm in Colorado. All the land, except the deeded ground near McFadden originally homesteaded by LeBeau's grandfather in the mid-1880s and the Colorado farm, is leased by the corporation. In total, the corporation controls approximately 20,000 acres.

"We don't run a picturesque operation by any means," says the 52-year-old rancher. "We operate just everywhere. We don't fit the picture book like people like to think about good solid ranchers."

The ranching operation includes about 900 brood cows. In its cattle-breeding practices, A.H. LeBeau & Sons avoids exotic crosses, preferring to stick with proven strains. Some hay is harvested from native meadows and from a small improved meadow on the home ranch. In recent years, the family has started holding calves until they are yearlings. Cattle are often transported from the McFadden home ranch to the ground in Albany County and Colorado. LeBeau describes the deeded ground as "unforgivable," with the violent winds of winter and the seering heat of summer.

Despite the hardships, the A.H. LeBeau & Sons cattle operation has shown a profit every year since Gerald LeBeau and his brother Lawrence became principals in the corporation in the mid-1950s. The brothers have run a tight ship. Perhaps more importantly, they have borrowed no money. The gospel according to A.H. LeBeau & Sons is based on tight-fisted, fiscal conservatism.

"I was brought up in a horribly conservative family," says LeBeau. "Too conservative for our own good financially, I think." LeBeau says during the first 10 years he was in the business, the family probably could have made additional land purchases and done quite well. By the same token, during the past decade when many ranchers bought additional land in what seemed to be an ever-appreciating market, the LeBeau family was content to operate in its traditional, conservative manner. Now that land values have dropped, the LeBeau approach looks like smart business.

A.H. LeBeau & Sons does not borrow money for operating purposes, no matter the purpose, no matter the amount. If the LeBeau family doesn't have the money, they simply don't make the purchase. They manage with what they have.

A banker nearly 30 years ago told LeBeau if he ever needed money for operating just to let him know. "If we need to borrow money, we'll just have to get a job somewhere," LeBeau replied. "We just don't do that. After all, we're not here to support the business, the business is here to support us."

Knowing how to handle money, knowing how to live within its means, no matter how meager those means might be, has kept the LeBeau cattle operation in the black when so many others are saddled with debt. "I think one of the biggest diseases among people in our business is that they look across the fence and think the other fella is doing so much better than they are," says LeBeau. "I look across the fence and I get the same feeling sometimes, but then you have to be realistic about the thing. If you'll just look at our operation, we run about as shoddy an outfit as there is around. We don't

run new pickups, we don't buy things we can't afford."

LeBeau says a neighbor who does borrow operating money told him one-half of all gross monies coming in on the neighbor's livestock is going out as interest payments. "We couldn't operate that way," says LeBeau. Never could and never will. So A.H. LeBeau & Sons shows a profit on cattle, year in and year out, for nearly 30 years and counting.

Just how much profit, however, is quite another matter.

"It's embarrassing, really, when you look at the figures and the amount of time we put in and the investment we have," admits LeBeau. "I can't say that it's a good business, to be real honest."

There is no comparison, for instance, between the profits on LeBeau's cattle herd and the profits on the family's small construction firm. If the family had to live on the earnings from the cattle operation alone, LeBeau doubts they could make ends meet. "We might be surviving and staying there, but we probably couldn't do it for long. There's a foolishness that goes along with this cattle business, but the foolishness runs out as soon as the money quits."

LeBeau believes the only sure cure for what ails the cattle industry is higher prices for his product. And the only way to achieve higher prices is through curtailment of supplies, perhaps through organized efforts by producers and by the introduction of cattle birth control techniques that are acceptable to the industry. LeBeau is disdainful of government subsidies for agriculture or any other industry. The marketplace alone should determine who stands and who falls.

Cattle ranching, as LeBeau views it, is an arena, with many sideline forces waiting to take advantage of favorable conditions created by the marketplace and governmental policies.

Not all the peripheral interest in agriculture has been entirely beneficial for the producer. Interest in agriculture purely for tax purposes, and land speculators, have hurt the person trying to make a living from the land, says LeBeau.

LeBeau takes the case of some feedlot operations. "The bonafide feedlot operator of a few years ago may have been trying to hold the weights (of cattle) down below say the 1,100-pound mark to get the optimum return on those cattle--the least input and the most return. Across the fence sits an oil company, letting cattle go to 1,400 or 1,500 or 1,600 pounds so that they can put more investment in them. It hurts you that way. Then they turn around and sell those cattle and put that much more weight on the market. So he's hurt you twice right there, just in that small operation. Then they blow that to 100,000 cattle and all those pounds, they've hurt us--and a lot."

LeBeau looks at the short grass prairie upon which he runs cattle and reflects there probably never was a time that could justify some of the land prices of a few years ago, based on the productive capacity of the ground. "Nothing you could produce on it, other than an oil well or a coal mine in this area, would ever pay it off," says LeBeau. "But we were living on the equity, the dream of the resale. And that's what kept people doing it. It kept some people in business, but it hasn't been healthy for this industry."

LeBeau expects to remain in the cattle business, despite the obstacles. He likes the life. He's at an age where he can afford to live the life he wants. As importantly, LeBeau doesn't have children.

"We're staying in," says LeBeau. "We've done it by hook and by crook. But if I had a family, if I had a family with young people, there would be no way to even consider it."

S.T. Mast, IPR

# #

BEA Data Indicate Falling Wyoming Farm Income during 1980s

Farm income dropped dramatically in Wyoming in the early 1980s, according to data through 1982 from the Bureau of Economic Analysis (BEA). Wyoming's farm income followed the same general trends as farm income in the United States and the Rocky Mountain Region, remaining fairly steady through the 1960s, with a sharp increase starting in 1971 and peaking in 1973, a slump bottoming out in 1976-1977, a second peak around 1979, and a decrease in 1982. However, Wyoming's slumps have been deeper than those of the United States as a whole, and Wyoming's 1982 plunge was drastic, with total farm income for that year amounting to less than 40 percent of the farm income reported in 1969, and one-fifth of the farm income level just two years earlier in 1980.

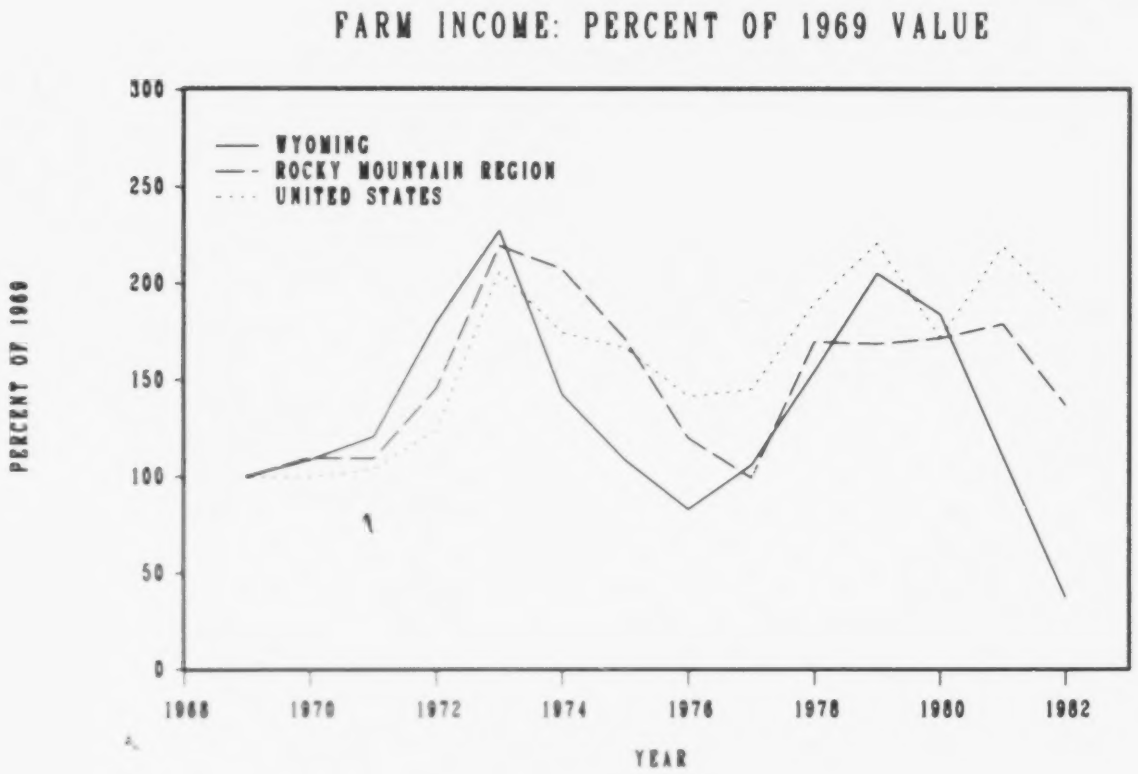
Total farm income was between 6 percent and 9 percent of total personal income in the state between 1959 and 1973, dropping to around 3 percent through 1980, and to half of a percent in 1982. During the peak year of 1973, farm income accounted for a quarter or more of total personal income in seven counties (Big Horn, Crook, Goshen, Johnson, Niobrara, Platte, and Sublette). By 1982, in these counties where farming had been a large part of the 1973 economy, total farm income had dropped considerably, to levels ranging from a quarter of 1973 farm income, to a net loss.

Big Horn, Goshen, and Park counties each had over $10 million in farm income during the peak year of 1973 (Big Horn, $13 million; Goshen, $21 million; Park, $18 million). In the second peak farm income year of 1979, two counties had farm income over $10 million: Goshen, $18 million (nearly one-fifth of the county's total personal income) and Park, $15 million. In 1982, farm income had dropped to $5 million and $3 million respectively in these counties.

Nearly all of the fluctuation in farm income derived from changes in farm proprietors' income, as farm wage and salary income remained quite steady. The variations in income per farm proprietor were more extreme in Wyoming than in the United States. Farm proprietors' income in Wyoming was $15,000 per proprietor in 1973, and dropped to a loss of $6,000 per proprietor in 1982, while the United States average farm proprietor's income was $11,000 in 1973 and $8,000 in 1982.

According to seasonally adjusted BEA quarterly income figures available through the third quarter of 1984, the situation of Wyoming farm proprietors can be considered to have improved somewhat. Wyoming farm proprietors' total income loss in 1984 was only about half of their loss in 1982.

The number of farm proprietors in the



United States dropped gradually by about 20 percent between 1967 and 1982. In Wyoming, there was a drop and then a rise: the number of farm proprietors fell by about 10 percent through 1974 and then rose again to about the 1969 number in 1981, falling again a little in 1982, to a total of 9,088. In both Wyoming and the United States, farm proprietors made up somewhat over a quarter of all proprietors in 1982, having dropped from around 40 percent of proprietors in 1967. Farm proprietorship was most prevalent in six Wyoming counties: Big Horn, Crook, Goshen, Lincoln, Niobrara, and Platte counties (farm proprietors made up about half or more of all proprietors in 1982).

In general, there have been considerably more farm proprietors than farm wage and salary workers. In 1982, Wyoming had half again as many farm proprietors as farm workers, while the United States had twice as many. However, four counties (Carbon, Natrona, Sublette, and Teton) had more farm workers than farm proprietors. In Wyoming in 1982, only about 3 percent of wage and salary workers were farm employed, but this figure was over 10 percent for Goshen, Niobrara, and Sublette counties.

The sources of the drop in farm proprietors' income came from both lower marketings and higher expenses. Cash receipts from marketings in Wyoming went from a high of $720 million in 1979 (83 percent of which was livestock receipts) to $530 million in 1982 (75 percent livestock), a drop of a quarter in total farm receipts and a third in livestock receipts.

Livestock sales in the United States were less than 40 percent of all farm marketings after 1972. In the Rocky Mountain Region, livestock sales were one-half to two-thirds of farm marketings during this period. However, in Wyoming, sales of meat animals and other livestock have been a large part of farm sales, three-quarters or more of cash receipts from farm marketings for most years from 1969 to 1982. Not all of the seven Wyoming counties with high 1973 proportions of farm income had high percentages of livestock marketings. In Johnson, Niobrara, and Sublette counties, over 90 percent of dollar farm marketings in all years were of livestock, but this ratio was 50 percent to 70 percent for Big Horn and Goshen counties.

With respect to livestock receipts between 1969 and 1982, Wyoming experienced a higher peak in 1979 and then a more drastic drop than did the rest of the country; the United States had only a mild slump, bottoming out in 1981.

In addition to lower marketings, a rise in farm production expenses affected farm income. Farm production expenses have been rising throughout the country, with the United States

LIVESTOCK DOLLAR MARKETINGS: PERCENT OF 1969 VALUE

total production expenses 16 percent higher in 1982 than they were in 1979. "Other expenses," which include repair and operation of capital items, depreciation, interest, rent and taxes, and other miscellaneous expenses, made up over half of 1982 production expenses in Wyoming, the Rocky Mountain Region, and the United States. This item was 25 percent higher in Wyoming in 1982 than in 1979. The second largest expense item in 1982 in Wyoming and the Rockies remained livestock purchases, at 15 percent of total Wyoming production expenses. However, livestock purchases in 1982 were down to just over half what they had been in 1979.

Farm problems in Wyoming are sometimes overlooked in concern over energy production impact. This report shows, however, that a number of farm counties, less affected by fluctuations in energy sales, are having economic difficulties of their own.

These inferences are drawn from data provided by the Regional Economics Information System (REIS) of the BEA. Data is available for the United States, Rocky Mountain Region, Wyoming, and Wyoming counties. Analysis is provided by the Census Retrieval Information Service (CRIS), a cooperative service of the Institute for Policy Research, University of Wyoming, and the Wyoming Department of Administration and Fiscal Control.

Judy Denison and G. Fred Doll, CRIS/IPR

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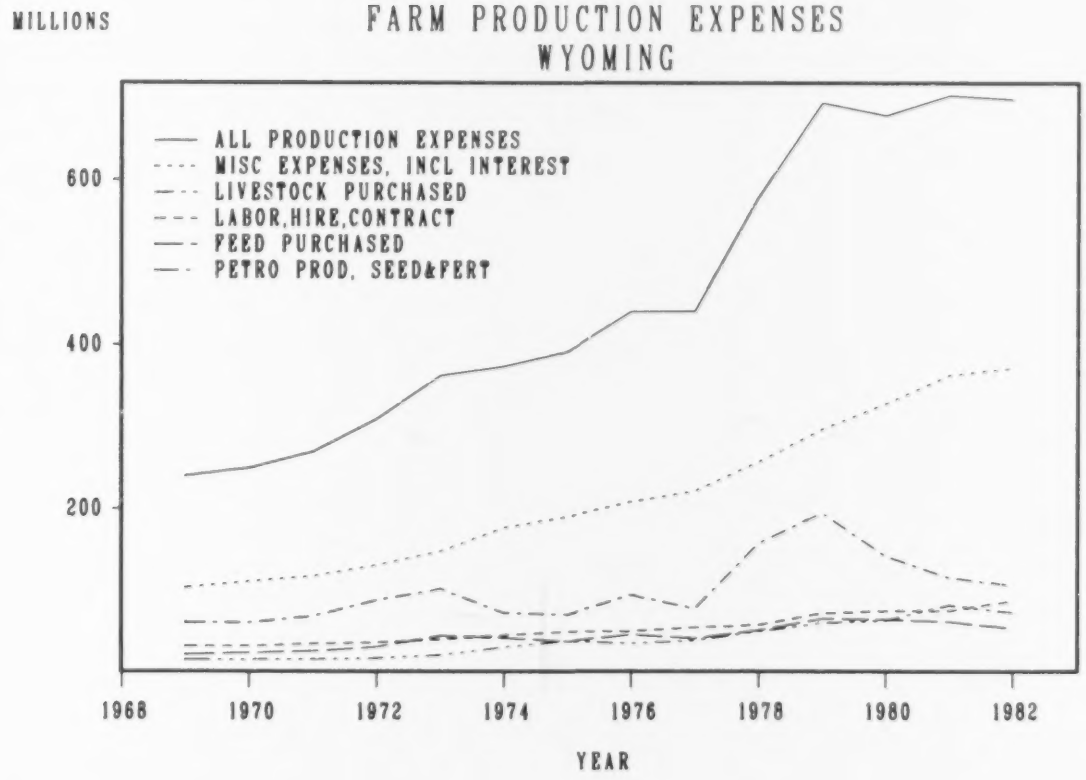


ECONOMIC CHANGES

ECONOMIC CHANGES

(Editor's note: The purpose of this section is to point out areas in the Wyoming economy in which noteworthy changes occurred, or in which existing trends were significantly accentuated, during the latest reporting period.)

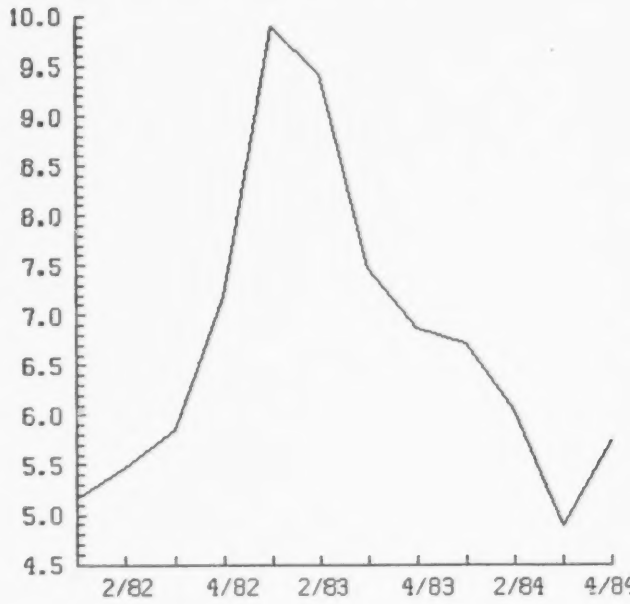
Recent developments in the number of new residential dwelling units constructed and labor force trends highlight the Update's fourth quarter 1984 statistics. Also mentioned are prices received by Wyoming ranchers and farmers.

With respect to labor force statistics, the state's unemployment rate rose for the first time since the first quarter of 1983. The 5.7 percent rate reached during the fourth quarter of 1984, however, was still 1.2 percentage points below the 6.9 percent rate recorded during the fourth quarter of 1983. At the same time, the number of unemployed persons dropped from 17,627 during the fourth quarter of 1983 to 14,533 during the fourth quarter of 1984.

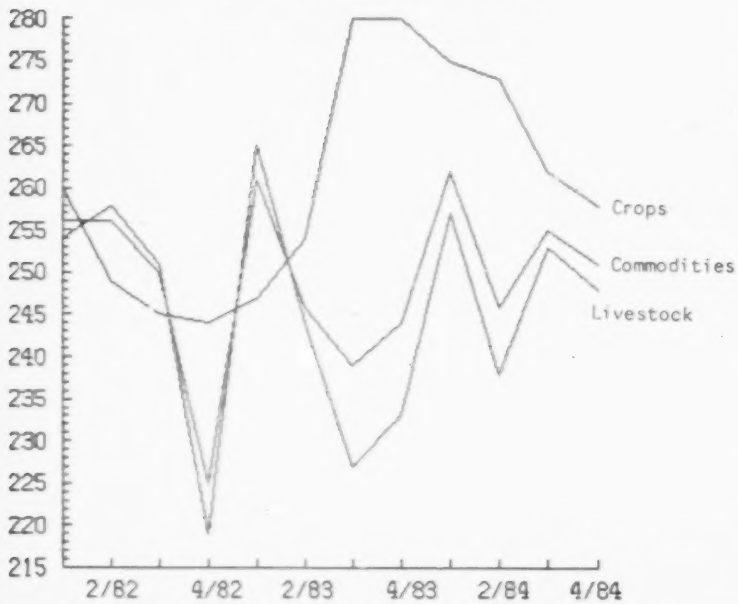
The number of new residential dwelling units, while showing a normal seasonal drop, was still the lowest mark reached during the Update's 12-quarter reporting period. During the fourth quarter of 1984, such units dropped to 426, down from 685 during the fourth quarter of 1983.

Prices received by Wyoming farmers and ranchers were mixed, when compared to the fourth quarter of 1983. Fourth quarter figures showed that all crops were down 6.81 percent, all commodities were up 5.44 percent, and livestock was up 9.65 percent.

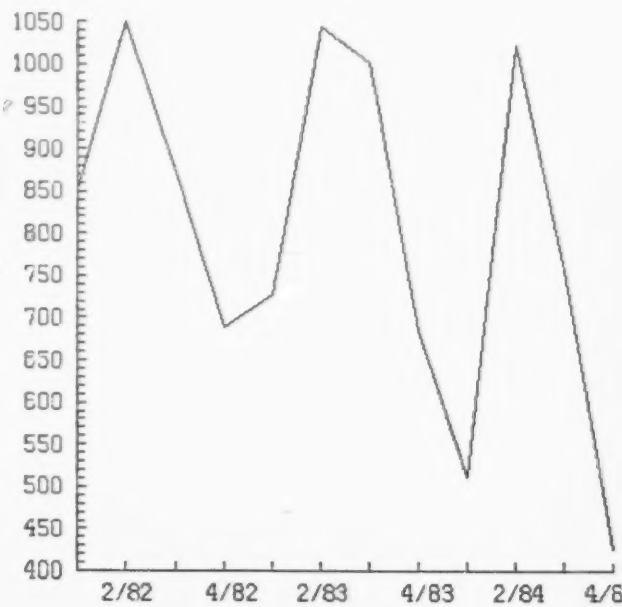
Unemployment Rate



Wyoming Prices Received
Indices-Latest (1967 = 100)



New Residential Units



WYOMING DATA

Table 5: Agriculture[1]

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Timber Cut in Wyoming National Forests (MBF)	11658.	4285.	23430.	26318.	14707.	5208.	35941.	47574.	21261.	7625.	48671.	63055.
Price Indices[2] (1967=100)												
2. Wyoming Crops, Prices Received-Latest	260.	249.	245.	244.	247.	254.	280.	280.	275.	273.	262.	258.
3. Wyoming Crops, Prices Received-Average	275.	251.	239.	243.	246.	253.	268.	279.	275.	277.	261.	260.
4. U.S. Crops, Prices Received-Latest	232.	240.	239.	220.	234.	239.	260.	262.	271.	279.	265.	240.
5. U.S. Crops, Prices Received-Average	238.	240.	235.	221.	226.	244.	255.	258.	265.	275.	271.	253.
6. Wyoming, All Commodities, Prices Received-Latest	256.	256.	250.	225.	261.	246.	239.	244.	262.	246.	255.	251.
7. Wyoming, All Commodities, Prices Received-Average	248.	261.	246.	234.	249.	253.	233.	239.	255.	256.	249.	252.
8. U.S., All Commodities, Prices Received-Latest	244.	252.	248.	232.	245.	243.	248.	256.	266.	262.	254.	245.
9. U.S., All Commodities, Prices Received-Average	243.	251.	247.	234.	240.	247.	247.	249.	263.	264.	259.	249.
10. Wyoming Livestock, Prices Received-Latest	254.	258.	251.	219.	265.	244.	227.	233.	257.	238.	253.	248.
11. Wyoming Livestock, Prices Received-Average	239.	264.	248.	231.	249.	253.	223.	228.	248.	250.	246.	250.
12. U.S. Livestock, Prices Received-Latest	254.	262.	257.	243.	256.	247.	240.	251.	263.	248.	245.	251.
13. U.S. Livestock, Prices Received-Average	248.	261.	258.	245.	253.	251.	242.	241.	262.	255.	249.	247.
14. Prices Paid by U.S. Farmers-Latest	314.	317.	316.	315.	321.	324.	326.	328.	335.	335.	333.	332.
15. Prices Paid by U.S. Farmers-Average	313.	315.	317.	315.	320.	324.	325.	327.	333.	336.	334.	332.

[1]First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.
[2]The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 6: Banking and Finance

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Total Bank Loans and Leases Financing Receivables (T$)[1]	*****	*****	*****	*****	*****	*****	*****	*****	2313197.	2359492.	2368731.	2352704.
2. Total Bank Deposits (T$)	3237333.	3322621.	3345619.	3587554.	3537206.	3669552.	3683748.	3789387.	3747828.	3812354.	3790977.	4005456.
3. Total Non Interest-Bearing Deposits (T$)[1]	*****	*****	*****	*****	*****	*****	*****	*****	657189.	734297.	723344.	742392.
4. Savings and Loan Mortgage Loans (T$)[2]	762153.	760622.	766593.	765708.	758938.	760041.	775159.	775795.	767125.	775396.	771560.	806660.
5. Savings and Loan Deposits (T$)	921642.	907758.	893087.	895889.	921290.	960250.	966113.	1006927.	1051271.	1087036.	1111213.	1142593.
6. Prime Interest Rate[3]	16.50	16.50	13.50	11.50	10.50	10.50	11.00	11.00	11.21	12.60	12.97	11.06

[1]During the first quarter of 1984, the Wyoming State Bank Examiner began publishing it's quarterly report ("The Abstract Report of State and National Banks in Wyoming") in a slightly different format. IPR will therefore be altering the following banking and finance data series: total bank loans and total demand deposits. Beginning in the first quarter of 1984, data for total bank loans will include lease financing receivables; data for total bank demand deposits will be replaced by figures for noninterest-bearing deposits. For comparison, the reader can refer to past issues of the WQU.
[2]Only members of the Federal Home Loan Bank Board are included.
[3]Rate is for the last month of the quarter.

Sources: Series 1-3: Wyoming State Bank Examiner Quarterly Report.
Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published Monthly.

Table 7: Business Conditions

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. New Domestic Corporations	389.	428.	403.	377.	348.	410.	366.	309.	359.	359.	332.	273.
2. New Foreign Corporations	357.	326.	285.	272.	240.	259.	331.	292.	260.	249.	259.	244.
3. Total New Corporations	746.	754.	688.	649.	588.	669.	697.	601.	619.	608.	591.	517.
4. Business Failures	31.	46.	54.	58.	47.	68.	52.	58.	59.	64.	67.	68.
5. Value of Business Failures ($)	2331991.	6842595.	-13034324.[1]	-6860186.[1]	6438421.	6400333.	535473.	-8163171.[1]	17789116.	14081414.	11774068.	12763251.
6. Personal Bankruptcies	96.	125.	123.	122.	140.	152.	172.	141.	180.	166.	169.	183.

[1]Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.
Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 8: Construction

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. New Residential Dwelling Units	851.	1050.	872.	689.	727.	1044.	1002.	685.	512.	1022.	755.	426.
2. Value of Residential Dwellings Constructed (M$)	40.4	58.6	51.2	41.9	44.4	70.7	60.3	40.0	30.6	59.6	44.5	26.9
3. Value of Nonresidential Construction (M$)	25.2	59.8	63.1	35.2	37.9	54.4	48.2	59.9	11.0	28.6	26.9	79.0
4. Building Permits Issued in Selected Wyoming Cities	2317.	3353.	4295.	2803.	2762.	3586.	3701.	2138.	2025.	3892.	3546.	2438.
5. Value of Authorized Construction (T$)	49768.	62939.	101359.	34470.	37119.	46402.	68715.	51924.	29471.	42320.	36344.	35282.
6. Mortgage Interest Rate[1]	14.93	14.74	14.34	13.09	12.97	11.90	12.08	11.94	11.56	11.61	12.03	12.05

[1]Conventional first mortgage for new home purchase. U.S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Construction Potentials." Published monthly.
Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 9: Consumers

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. New Truck Registrations	4176.	3636.	3024.	3230.	3233.	3415.	3417.	4363.	3927.	4418.	4102.	4574.
2. New Car Registrations	4249.	4042.	3506.	3610.	3272.	3539.	3671.	3483.	3083.	3741.	3676.	3397.
3. Wyoming Personal Income[1] (M$)	6231.	6231.	6244.	6194.	6069.	6031.	6115.	6290.	6456.	6564.	6734.	INA
4. US Disposable Income (B$)	2132.	2157.	2196.	2238.	2261.	2303.	2367.	2429.	2502.	2554.	2606.	2649.
5. US Personal Income[1] (M$)	2527108.	2560141.	2586517.	2629557.	2651491.	2704870.	2753109.	2825955.	2908890.	2970903.	3032708.	INA
6. Latest US Consumer[2] Price Index (1967=100)	282.5	290.1	292.8	292.0	293.0	297.2	300.8	301.5	303.3	306.2	312.1	312.2
7. Quarter's Average US CPI	281.9	286.8	292.3	292.9	292.5	296.1	299.5	301.4	303.1	305.2	310.0	312.1
8. Liquor Sales (T$)	7789.	9057.	8917.	10464.	7102.	7868.	8455.	9863.	6622.	7478.	8180.	9554.

[1]Revised series. Business Week, the previous source for monthly personal income for Wyoming and the U.S., has discontinued its series. Personal income data will subsequently be collected from the Bureau of Economic Analysis, U.S. Department of Commerce. Readers should be cautioned that the two series are not comparable.

[2]Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers, not the CPI-U.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
Series 3,5: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 10: Employment and Labor[1]

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Civilian Labor Force	243298.	257820.	258974.	251909.	250258.	267248.	273592.	256902.	253365.	261676.	261271.	253243.
2. Employment	230717.	243696.	243798.	233790.	225488.	242087	253149.	239275.	236361.	245871.	248480.	238710.
3. Unemployment	12581.	14123.	15177.	18120.	24770.	25161.	20443.	17627.	17005.	15805.	12791.	14533.
4. Unemployment Rate	5.2	5.5	5.9	7.2	9.9	9.4	7.5	6.9	6.7	6.0	4.9	5.7
5. Initial Claims Filed	11237.	11225.	10894.	14183.	15650.	10951.	8657.	11117.	10502.	7271.	5256.	8237.
6. Applications Received	12070.	14838.	15359.	13102.	12970.	11787.	12144.	9359.	10290.	11541.	11375.	9685.
7. New Non-Agricultural Openings	6119.	8344.	9190.	7035.	4724.	6185.	7992.	5528.	4679.	9779.	12905.	8655.
8. New Non-Agricultural Placements	5138.	7161.	8079.	5450.	4106.	6608.	10529.	6446.	5946.	9111.	10348.	8331.
9. Miners' Average Weekly Hours	42.0	41.7	39.7	38.1	39.9	39.5	41.8	41.2	42.9	43.0	43.5	43.7
10. Miners' Average Weekly Pay ($)	476.53	480.37	471.92	464.35	490.14	490.96	521.24	519.71	549.49	560.15	562.46	570.24
11. Miners' Average Hourly Wage ($)	11.34	11.52	11.90	12.18	12.27	12.43	12.47	12.60	12.81	13.03	12.94	13.05

[1]The most recent year's data are preliminary.

Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published quarterly.

Table 11: Energy and Mineral Production

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Wyoming Coal (TST)	26586.	25809.	24257.	26054.	25400.	24746.	29784.	27401.	32626.	28942.	31806.	33619.
2. U.S. Coal (TST)	219743.	209771.	195253.	189307.	190260.	180439.	204117.	19805.	226875.	223538.	246163.	188116.
3. Wyoming Oil (TBPD)	358.	354.	324.	324.	321.	311.	325.	318.	309.	307.	307.	312.
4. U.S. Oil (TBPD)	8629.	8657.	8653.	8679.	8679.	8658.	8680.	8700.	8648.	8675.	8662.	8692.
5. Wyoming Natural Gas (MCFD)	1136.	1138.	1075.	1306.	1172.	1269.	1050.	1373.	1348.	1255.	1250.	INA
6. U.S. Natural Gas (MCFD)	55449.	50977.	48349.	48335.	47683.	43073.	44703.	48924.	52238.	48581.	47841.	INA

Sources: Series 1,2,5, and 6: U.S. Department of Energy. Energy Data Reports. Gas data are published monthly, and coal data are published weekly.
Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production published weekly.

Table 12: Government

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Sales and Use Tax Collections (T$)	73830.	66759.	65903.	61208.	56909.	46453.	53361.	55424.	55954.	51151.	57132.	59570.
2. Violent Crime[1]	373.	389.	411.	295.	301.	274.	409.	241.	221.	318.	350.	334.
3. Nonviolent Crime[2]	4811.	5778.	6346.	5093.	4802.	4821.	5319.	4219.	3728.	4486.	4790.	4170.
4. Stolen Property (T$)	3541.	4562.	3982.	2963.	3176.	2918.	3005.	2892.	2065.	2627.	2856.	2487.
5. Stolen Property Recovery Rate	46.9	49.3	42.8	42.8	46.5	36.9	40.3	46.1	42.7	42.9	51.5	45.5
6. Percent of Crimes Cleared[3]	24.9	21.0	20.1	21.3	22.8	21.8	24.2	23.5	30.9	22.4	22.9	30.7

[1]Murder, negligent homicide, forcible rape, robbery, aggravated assault.
[2]Burglary, larceny, auto theft.
[3]Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.
Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 13: Tourism

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
Visitors, National Parks and Monuments												
1. Yellowstone	82758.	600071.	1614242.	116082.	65368.	553986.	1653211.	133088.	63927.	536765.	1561475.	100802.
2. Grand Teton	185935.	820236.	2066704.	371007.	183675.	686326.	1462761.	238442.	136459.	522640.	1373523.	206891.
3. Devil's Tower	9425.	86305.	161989.	13232.	8912.	87506.	160953.	16894.	9037.	72461.	131447.	15145.
4. Fossil Butte	596.	6691.	10303.	1601.	626.	5134.	9120.	4206.	246.	4246.	9107.	1762.
5. Fort Laramie	5037.	31447.	51881.	6906.	4887.	28311.	56592.	7665.	2352.	27529.	54704.	5527.
6. Big Horn NRA-South[1]	17701.	42059.	53839.	30720.	13428.	44977.	56419.	29358.	18715.	45104.	67403.	26388.
Other Tourism Indicators												
7. Traffic Count (Avg. # of Vehicles/Day)	103864.	126037.	166170.	97892.	84187.	122665.	167385.	97696.	85780.	125371.	169579.	101625.
8. Hotel, Motel, and Camp Sales Tax (T$)	1247.	1273.	2226.	1323.	912.	1048.	2017.	1397.	979.	1084.	2178.	1389.
9. Gasoline Sales (TGL)	72548.	93556.	108733.	81347.	71330.	81160.	107116.	79911.	63980.	85891.	102748.	INA

[1]Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
Series 8: Wyoming Department of Revenue and Taxation monthly report.
Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 14: Utilities[1]

Calendar Quarters	1/82	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84
1. Residential Electric Connections	174018.	174126.	177081.	177968.	179111.	179717.	178762.	178535.	179967.	179536.	178837.	179123.
2. Residential Electric Consumption (TKWH)	504636.	375401.	302786.	391608.	489892.	392223.	294755.	395182.	562483.	437086.	359496.	484523.
3. Commercial Electric Connections	30833.	31086.	30841.	30388.	30772.	31194.	30533.	31404.	32340.	32462.	32874.	32738.
4. Commercial Electric Consumption (TKWH)	354594.	319879.	331351.	327961.	351633.	327565.	353743.	342219.	485953.	437983.	455181.	468378.
5. Industrial Electric Connections	3581.	3451.	3702.	3751.	3647.	3667.	3655.	3624.	3119.	3150.	3122.	3059.
6. Industrial Electric Consumption (TKWH)	1266782.	1179112.	1178792.	1225845.	1471528.	1388817.	1397176.	1016334.	1456749.	1911229.	2049121.	2479998.
7. Other Connections[2]	4520.	4778.	3243.	2857.	2819.	3059.	3164.	2791.	2759.	3155.	3438.	3165.
8. Other Consumption (TKWH)	48237.	31570.	70139.	12240.	6780.	8710.	46427.	13306.	6129.	13775.	50031.	10385.
9. Residential Natural Gas Connections	75677.	75413.	74861.	75955.	76567.	76449.	74638.	75037.	76263.	75081.	74802.	75736.
10. Residential Natural Gas Consumption (TCF)	4607468.	2504865.	872772.	2972244.	6531664.	8926691.	2871311.	8444801.	15230399.	8356402.	2804867.	9293855.
11. Commercial Natural Gas Connections[3]	6482.	6552.	6452.	6476.	6873.	6869.	6710.	6817.	6881.	6817.	6770.	6859.
12. Commercial Natural Gas Consumption (TCF)[3]	1955899.	1075767.	385052.	1196763.	3667569.	5716746.	1792146.	4865053.	9496853.	5231096.	1656779.	5481602.
13. Industrial Natural Gas Connections	89.	90.	90.	95.	97.	97.	97.	98.	94.	95.	96.	93.
14. Industrial Natural Gas Consumption (TCF)	7328389.	5335475.	5564715.	7918440.	7626560.	10221456.	9291988.	13201149.	13193998.	25099377.	12505089.	26405131.
15. Other Natural Gas Connections[3]	400.	404.	409.	409.	48.	48.	46.	45.	45.	46.	46.	46.
16. Other Natural Gas Consumption (TCF)[3]	299920.	134722.	44697.	138389.	176.	322.	5323.	267.	235.	905.	5882.	336.

[1] Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

[2] "Other" includes agriculture, municipal, and other public.

[3] Figures for the first and second quarter of 1983 reflect a change in the authority connections/consumption made by the Northern Utilities. Prior to January 1983, the company listed public authority under the category of other natural gas connections/consumption. Northern Gas now combines public authority connections/consumption with their commercial natural gas connections/consumption.

NOTE: Due to divestiture, Mountain Bell is no longer able to provide IPR with the telephones in service figure; because Mountain Bell accounts for the bulk of telephone mainline service in Wyoming, IPR has decided to discontinue the telephone data series.

Sources: Series 1-18: Reports to IPR by selected electric, natural gas, and telephone utility companies. Survey conducted monthly.

Wyoming Comparative Cost of Living Index* (January 9-11, 1985): Cheyenne = 100

City	Rank	All Items	Food	Housing	Transportation	Medical
Jackson	1	115.43	108.49	134.66	100.30	101.48
Gillette	2	112.89	109.01	127.98	102.50	107.63
Evanston	3	111.83	100.94	129.18	104.79	100.86
Sundance	4	110.82	109.44	127.35	95.12	109.16
Kemmerer	5	110.36	102.11	127.32	98.86	102.64
Pinedale	6	108.45	114.94	113.07	101.44	106.72
Sheridan	7	108.25	106.68	118.24	99.50	100.90
Casper	8	106.20	107.95	108.96	105.06	107.85
Buffalo	9	103.12	102.85	106.12	98.66	100.16
Wheatland	10	102.52	103.27	104.37	99.82	101.77
Rock Springs	11	102.42	107.61	103.02	99.47	97.73
Thermopolis	12	101.87	112.20	99.39	98.92	98.16
Worland	13	101.63	110.91	101.38	96.33	100.17
Cody	14	101.63	113.00	97.76	97.61	102.11
Douglas	15	100.15	101.83	96.73	101.20	106.25
Rawlins	16	100.09	104.13	101.31	100.02	94.93
Riverton	17	100.07	101.44	101.42	101.87	100.87
Cheyenne	18	100.00	100.00	100.00	100.00	100.00
Laramie	19	99.67	104.53	100.58	97.98	97.41
Newcastle	20	99.02	108.55	95.72	96.62	103.68
Greybull	21	98.47	106.54	92.09	98.95	102.80
Lusk	22	94.33	103.48	81.45	99.24	99.72
Torrington	23	90.60	98.40	77.99	96.52	97.85

*Apparel and Recreation Indices not shown.

Source: Wyoming Department of Administration and Fiscal Control.

Average Rents by City, Fourth Quarter 1984*

City	Average Apartment Rent	Average Trailer Lot Rent
Cheyenne	318.61	117.50
Buffalo	294.17	105.00
Casper	312.87	136.25
Cody	307.32	117.50
Douglas	340.22	117.50
Evanston	404.69	204.00
Gillette	348.66	177.50
Greybull	258.33	76.50
Jackson	356.84	105.00
Kemmerer	396.88	130.00
Laramie	356.00	121.25
Lusk	289.29	90.00
Newcastle	294.55	87.50
Pinedale	301.82	75.00
Rawlins	305.71	122.50
Riverton	290.14	115.00
Rock Springs	342.38	157.50
Sheridan	321.71	127.50
Sundance	238.33	85.00
Thermopolis	298.00	110.00
Torrington	268.24	57.50
Wheatland	251.11	100.00
Worland	308.33	120.00

*Prepared by Research and Statistics, Department of Administration and Fiscal Control.

Format

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 1st quarter of 1982, and end with the 4th quarter of 1984. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Most annual data series will reappear in WQU only when updated, or about every fourth issue. Quarters are calendar quarters. For example, the 3rd quarter is composed of July, August, and September. In the table headings and narratives, a particular quarter will be indicated by notation such as 2/80 (2nd quarter, 1980), 1/80 (1st quarter, 1980), and so on.

Beside each data series name is an abbreviation in parentheses. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the state unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronymn "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board Feet

TKWH - Thousand Kilowatt Hours

$ - Dollars

M$ - Millions of Dollars

B$ - Billions of Dollars

T$ - Thousands of Dollars

H$ - Hundreds of Dollars

ST - Short Tons

TST - Thousands of Short Tons

MCFD - Million Cubic Feet Per Day

TBPD - Thousands of Barrels Per Day

GL - Gallons

TCF - Thousands of Cubic Feet

KWH - Kilowatt Hours

TGL - Thousands of Gallons

HBBL - Hundreds of Barrels

HMCF - Hundreds of MCF Per Day

HST - Hundreds of Short Tons

$/ST - Dollars Per Short Ton

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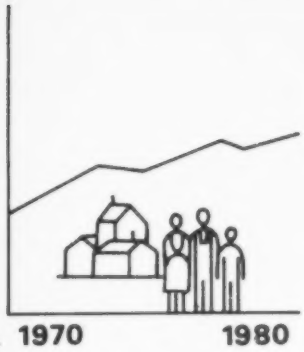

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Judy Denison and G. Fred Doll
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University of Wyoming

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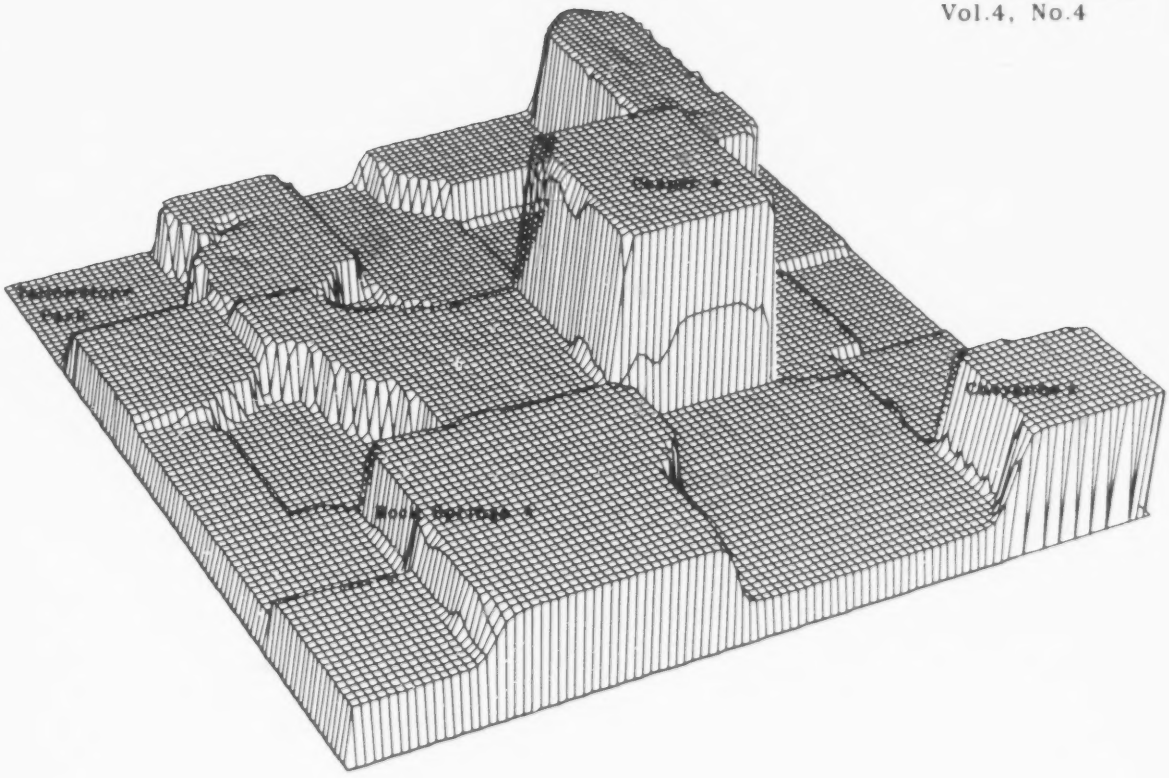
WYOMING QUARTERLY UPDATE

Summer 1985
Vol.4, No.4



IPR

1983 Construction-Generated Earnings by County
(Percentage of State Total)

Wyoming Quarterly Update

Wyoming Quarterly Update (WQU) represents the efforts of the Institute for Policy Research (IPR) at the University of Wyoming to provide improved data access services. The data presented in WQU are assembled from secondary sources, such as government agencies and private industry. The staff of IPR greatly appreciates the ongoing, cheerful cooperation of each of the data sources listed in the bibliography.

WQU provides current indicators and timely, easily accessible data. Most of the data published in WQU are updated quarterly with the most current numbers. The complete data sets from which WQU originates are maintained, together with documentation by IPR. Readers are encouraged to contact IPR to find out how to gain access to data which do not appear in the WQU. Many data series, such as gasoline sales and taxation data, span more than 30 years. Numerous other series cover 20 years or more.

Efforts to expand the subject and geographic detail (county data) of data sets will be made continuously. Featured for the fifth time in this edition is an industry profile. In this edition, a discussion of the construction sector is presented.

The cover of each edition features a contour map illustrating the geographic distribution of a particular variable. This edition presents a contour map depicting 1983 construction-generated earnings by county (percentage of state total).

First-time readers of WQU should refer to the "format" explanations on page 48 for keys on how best to use and interpret data presented in this publication.

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Wyoming Quarterly Update is published four times per year in fall, winter, spring, and summer editions.

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WYOMING SCENE

Overview and Perspective

The good news in the national economy is that signs have appeared indicating a revival from the first-quarter doldrums. The bad news is that the strength of the dollar overseas could put a damper on the good news.

Prospects for business do appear brighter for the second half of the year. New orders for hardgoods manufacturing rose 4.1 percent in May, to $103.8 billion. It was the best performance since January. Defense orders accounted for much of the increase, rising $3 billion to $9.1 billion. In addition, consumer orders at hardgoods factories jumped 8.1 percent in May, reflecting the effects of lower interest rates.

Inflation also remained low. The consumer price index rose a scant 0.2 percent in May. Most of the recent price fluctuations in the CPI have been attributable to the volatility in food and energy prices, with most other price categories remaining remarkably stable. As inflation remains low, the Federal Reserve will be prompted to continue efforts to stimulate interest-sensitive sectors of the economy.

Job gains also could signal a strengthening of the economy. After a sluggish first quarter, large employment gains were registered in May. By June, factory payroll employment was rising at an annual rate of 3.5 percent--twice as fast as the growth of the labor force. If such trends continue, the unemployment rate could fall below 7 percent for the first time in five years.

Employment on nonfarm payrolls rose 345,000 in May. Jobs in retail trade jumped 110,000, while construction jobs increased by 30,000. Construction employment has increased 211,000 since December. Construction normally accounts for less than 5 percent of all nonfarm jobs, but since December, growth in construction payroll employment has been more than 15 percent. In addition, service jobs have increased by 1.3 million since December, more than offsetting the 162,000 jobs lost in manufacturing.

Factory jobs remained nearly unchanged in May. Lumber and building materials, furniture, metals, machinery, and transportation equipment posted slight gains or held steady. While not truly positive, the performance was at least better than the losses registered in recent months. Employment at factories producing softgoods, however, fell by 25,000. Since December, three-fourths of such losses have been in textiles, and both electrical and nonelectrical machinery.

The Commerce Department's Index of Leading Indicators climbed 0.7 percent in May, following declines in the previous two months. At the same time, however, the U.S. posted a $12.7-billion merchandise trade deficit in May, the largest since January. On the one hand, the indicators could mean renewed vitality in the economy. On the other, trade performance could virtually wipe out any gains. The trade deficit has been widely blamed for the sluggish economy in recent months. Some economists warn,

moreover, that the trade deficit could impede a strong surge and hold economic growth to 2 percent to 2.5 percent during the second half of the year.

One indication of the continuing import battle was in the arena of auto sales. Sales of domestic auto manufacturers fell in mid-June, due mainly to a 12.6 percent decline posted by General Motors. During the period from June 11 to June 20, the seven automakers sold 240,639 units, down 7.4 percent from year-earlier figures. Foreign competition and the strong dollar overseas were major factors cited in the decline.

Capital investment spending has been running well below earlier expectations. Originally, the Commerce Department had projected a first-quarter rise of 5.1 percent. When the quarter was completed, however, the actual rise was only 1.1 percent. Currently, the Commerce Department reports that business plans to increase spending by 9.2 percent, to $386.1 billion, for 1985. But given the sluggish pace of output in recent months, the betting among many economists is for much more modest increases.

Investment in new buildings appears to be faring better. Contracting for new buildings rose in May, extending a record stretch that started in March. The Dodge Index was 162 in May, about the same level as March and April, but the strongest ever three-month period for contracting.

The big economic-related news in Washington, D.C., in recent weeks has been President Reagan's new tax reform package. The new program would lower individual tax rates, while eliminating some significant deductions. Predictably, much of the reaction pro and con has been in direct proportion to whose ox gets gored. In its June 17 edition, Business Week magazine estimated that over the next two years the Reagan plan would slash capital investment by $48 billion, boost consumption by $8 billion, lower interest rates by one percentage point, and cut the gross national product by $25 billion. The proposition of tax reform itself, however, has gained bipartisan support on Capitol Hill. The current tax code has been widely denounced as an inequitable, inscrutable hodge-podge that continues to frustrate and infuriate the American taxpayer.

In Wyoming, the agriculture sector continues to struggle, facing low commodity prices and the potential for drought this summer. In some areas of the state, rainfall has been 50 percent to 60 percent below normal (see "Summer Agricultural Outlook.")

The construction sector, on the other hand, is coming out strong, spurred by a number of major projects in southwestern Wyoming. The largest is Exxon's $2.2-billion LaBarge Project. Peak employment on the project during the third quarter is expected to top 5,000 workers.

S.T. Mast, IPR

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Summer Minerals Outlook

OVERVIEW

The brightest spot in Wyoming's mineral industry since the last update was the final production statistics for oil and natural gas in 1984. The Wyoming Oil and Gas Conservation Commission reported oil production was up 5 percent over 1983, and natural gas production increased by 11 percent. Lest one forget, however, the current production gains in petroleum and natural gas are in great part a reflection of the booming exploration of the early 1980s, particularly 1981. In other words, the discoveries of half a decade ago are now reaching fruition as the discoveries associated with that drilling approach or pass their full development.

Without accelerated activities, by 1987 the state's declining production from older oil fields will probably more than offset production from new fields, and at least oil production will start a slow decline again. Drilling activities are currently very similar to those in the late 1970s--a time when oil production was declining slowly, but steadily.

The petroleum industry, while surviving at a reduced pace, is currently contemplating the individual and cumulative effects of new regulations under the Federal Oil and Gas Royalty Management Act (FOGRMA), the Bureau of Land Management's plans for resurveying large areas of the Powder River Basin, the proposed land interchange between the Bureau of Land Management and Forest Service, the possibility of new federal leasing procedures, the possibility of a new state lease form, and a general opposition to drilling planned for remote and usually untested mountainous areas in the state (primarily national forest lands) even when the sites are to be built, supplied, and maintained by helicopter mobilization. All these items collectively are slowing or restraining activity at a time when demand and price are also working to slow things down. Although recent production of oil and natural gas currently does not reflect the slowdown, the effects of reduced exploration will be seen not too many years in the future if activities do not soon turn around for the better.

At least oil and gas prices have apparently stabilized for the time being. Prices for coal and uranium, however, are still falling. Although prices for most of the state's other mineral products are below their values in the early 1980s, the prices seem to have bottomed out.

The coal industry may register another good production gain in 1985 if the trend of the first quarter continues. Production for the first three months of 1985 is running about 10 percent above 1984. Unfortunately, high mining costs in the Hanna Coal Field of south-central Wyoming are creating serious problems for the mines in that area. The Hanna Coal Field will probably only have two active surface mines left before the year is out, and Wyoming's only underground coal mine could also close before the end of the year if their contract with an Indiana utility is voided, or if the utility simply pays for the coal, but refuses delivery. This modern, very efficient, long-wall mine produces 1.5 million tons per year and employs several hundred miners.

Gary B. Glass, State Geologist,
Wyoming Geological Survey

METALS AND PRECIOUS STONES UPDATE

Although the Wyoming field season arrived early this spring, only subdued exploration for metals is anticipated. The lack of interest for metals is due to the strong U.S. dollar, low gold prices, and sub-economic base metal prices.

Even with the diminished activity, some areas should still receive attention--in particular, the South Pass region in the southern Wind River Mountains and the Silver Crown District in the southern Laramie Range. In addition, one major company began grass-roots exploration for gold and zinc in Wyoming. Finally, the Metallic Minerals Section of the Geological Survey of Wyoming is conducting several investigations. One of these investigations was initiated to help avoid serious problems for future exploration activity and is related to the Department of Environmental Quality's abandoned mine reclamation program.

South Pass

Two major gold districts occur at South Pass: the South Pass-Atlantic City and Lewiston districts. In the South Pass-Atlantic City District, Freeport Exploration is expected to

continue activities at Miners Delight, and a company based out of Salt Lake City is expected to continue underground exploration at the Carissa Mine. Freeport Exploration is also expected to continue with its project in the Lewiston District.

Last field season, Freeport sampled and trenched several zones of mineralization in both the South Pass-Atlantic City and Lewiston districts. In the upcoming field season, Freeport is expected to begin drilling on its Miners Delight and Lewiston properties.

The Miners Delight area includes the historic Miners Delight Mine and nearby placers. This area was the most productive in the South Pass region, with the Miners Delight Mine producing an estimated 63,500 ounces of gold. Production from nearby placers that drain the Miners Delight area have accounted for an estimated 80,915 ounces of gold.

Historic records on the now inaccessible mine workings suggest that the shaft was sunk to a depth of at least 275 feet, with more than 2,400 feet of drifts on a 3-foot to 16-foot wide shear. An unrecorded number of stopes, inclines, and crosscuts were also driven by the early miners. Gold was free-milling, and the selectively mined ore ran from 0.35 ounce of gold per ton up to as high as 190 ounces per ton. The ore is hosted by metagreywacke intruded by metadacite.

The Lewiston District includes several historic gold mines, the more notable of which are the Burr and Hidden Hand. Historic records indicate that gold was first discovered in the district in 1879 at the site of the Burr Mine. Early newspaper articles suggest that the Burr Mine was a household name to western miners and prospectors because of some incredibly rich gold ore produced from the property. Some mineralized zones reportedly assayed 25 ounces to 250 ounces of gold per ton. Also at a depth of 25 feet, a zone of scheelite, assaying between 2.5 percent to 70 percent tungsten, was intercepted.

The Hidden Hand Mine, located north of the Burr Mine, also contained some rich gold ore. Some ore from the mine contained as much as 75 ounces of gold per ton. In 1894, it was reported that 1,000 tons of ore were mined that contained more than four ounces of gold per ton.

The Carissa Mine, located near South Pass City and within the South Pass-Atlantic City District, is being explored by a company out of Salt Lake City. More than a year ago, a new headframe was constructed over the primary shaft, and the mine operators recently cleared the more than 300-foot-deep shaft and dewatered the upper mine levels. Presently, the company is mapping the upper workings and attempting to clear a winze to gain access to the lower level. Available maps show the mine to be 400 feet deep with four levels. More than 2,300 feet of drifts and several hundred feet of stopes were mined. The ore averaged 0.32 ounce of gold per ton and ranged from a trace to 2.64 ounces per ton. The ore is hosted by a sheared metagreywacke, and an estimated 53,680 ounces of gold were produced.

Mapping by the Geological Survey of Wyoming in the southeastern portion of South Pass has delineated a basal suite of ultramafic flows and sills. The presence of the ultramafic suite helps support the fact that South Pass is a greenstone belt and therefore should have good potential for economic gold deposits.

Silver Crown District

The Silver Crown District, located in the southern Laramie Range about 25 miles west of Cheyenne, is again being explored by an undisclosed mining company. The district was mined in the late 1800s and early 1900s for copper, with minor gold and silver. Presently, the primary interest in the district is for low-grade gold reserves. At the historic Copper King Mine in the southern half of the district, the following reserves have been outlined by drilling:

Tons (ore)	Gold (oz/ton)	Copper (%)
2,800,000	0.044	0.36
6,000,000	0.038	0.32
13,500,000	0.028	0.26
35,000,000	0.022	0.21

This ore lies near the surface and extends to a depth of at least 1,024 feet. Spectrographic analyses have detected traces of lead, zinc, tungsten, and 0.5 percent to 3 percent titanium. Similar untested geophysical and geochemical anomalies occur both east and west of the Copper King.

Abandoned Mine Reclamation

The Land Quality Division of the Wyoming Department of Environmental Quality has at least a five-year, statewide program to reclaim abandoned coal, uranium, industrial minerals, and metal mines. Mines that are considered hazardous have high priority. The Metallic Minerals Section and other sections of the Geological Survey of Wyoming are conducting field investigations related to the program and providing recommendations on many of the mines in order to protect important historic, exploration, and scientific values. However, a number of the historic mines will be buried and reclaimed. Contracts have been issued to reclaim several mines in the Medicine Bow and Sierra Madre mountains. Contracts will be issued in the near future for mines in the Lewiston and Copper Mountain districts.

In other activities around the state, the Geological Survey of Wyoming collected more than 500 pounds of rock from the Leucite Hills near Rock Springs to test for diamonds. The Leucite Hills area consists of several scattered plugs and flows of wyomingite, orendite, and madupite that are ultrapotassic lamproites suspected to have a genetic link with kimberlite (Carmichael, 1967; Ogden, 1979). Diamonds were recently discovered in similar leucite- and olivine-lamproites in the West Kimberly Province of northwestern Australia (Atkinson and others, 1984). One of the Australian lamproites, known as the Argyle pipe, contains more diamonds per ton that any kimberlite or any other lamproite in the world. This diamond-rich lamproite has generated considerable interest in lamproites worldwide. With this in mind, the Geological Survey of Wyoming sampled the Leucite Hills.

W. Dan Hausel, Deputy Director,
Wyoming Geological Survey

URANIUM AND INDUSTRIAL MINERALS UPDATE

Uranium

On March 1, the Petrotomics uranium mine and mill in the Shirley Basin closed operations. Texaco closed the mine, which they had earlier acquired from Getty Oil. This closure leaves Wyoming with three operating mines: COGEMA-Pathfinder's mines in the Gas Hills and Shirley Basin, and Bear Creek Uranium's (subsidiary of Union Pacific) mine in the Southern Powder River Basin District.

Even in Wyoming's operating mines, layoffs and cutbacks are continuing. Bear Creek laid off nine employees in the second quarter of 1985.

The prospects for a revival of the uranium mining and milling industry in Wyoming still appear slim. The current spot market price for refined uranium is $14.25 per pound. This compares with a price of $42.00 per pound in early 1979. The current price reflects the low demand for uranium for nuclear power plants. Although stockpiles of uranium bought by the utilities under contracts signed in the late 1970s are being depleted, the low cost of foreign uranium is reducing interest in new contracts from domestic uranium sources. However, even with the mine closings, mine production in 1984 exceeded uranium consumption by 40 percent.

Reclamation of uranium mill tailings is also in the news. Wyoming Senator Alan Simpson introduced a bill to speed up mill reclamation, with costs to be shared by utilities (55 percent), mining companies (15 percent), and the federal government (30 percent). However, there are groups which want mining companies to bear the entire cost for cleaning up the mill tailings.

In contrast to the U.S. nuclear industry, European nuclear-generating facilities are being built at a rapid rate. The European community has reduced its dependence on Middle East oil from 62 percent to 32 percent in 10 years, according to an article in the American Mining Congress Journal. In Europe, nuclear plant construction is economically attractive compared to other sources (Europe does not have the coal resources of the United States). As a result of the continually increasing demand for reactor fuel, uranium prices have risen everywhere but in the United States and Japan.

A new 1:500,000-scale map of Wyoming showing the location of uranium mines and uranium and thorium mineral occurrences is available from the Geological Survey of Wyoming in Laramie. The map also shows the apparent geologic origin of the deposits and occurrences, and identifies the host rock at each location. An accompanying introduction gives a review of Wyoming's uranium industry and contains an explanation for the map.

The map and explanation are available as Open File Report 85-6, Uranium Mines and Uranium and Thorium Occurrences in Wyoming. The cost of Open File Report 85-6 is $7.00.

A set of two maps that show expected background gamma radiation levels of the Torrington 1° x 2° map area is also available from the Geological Survey of Wyoming. The Torrington map area covers the northern parts of Albany, Goshen, and Platte counties, southern Niobrara County, and southeastern Converse County, including the towns of Torrington, Wheatland, Lusk, Douglas, and Glenrock. The maps and accompanying explanation were compiled from 340 field measurements. Natural background gamma radiation comes from two sources: radioactive isotopes contained in all earth material (terrestrial radiation) and cosmic radiation. The two maps show values for both cosmic and terrestrial radiation.

The maps and explanation are available as Open File Report 85-9. The cost is $6.50. These open file reports may be ordered from the Geological Survey of Wyoming, Box 3008, University Station, Laramie, Wyoming 82071, or call (307)766-2286.

Bentonite

The outlook for bentonite production in Wyoming remains good, as demand for bentonite (other than for drilling mud) is expected to increase. Prices remain at a low level but should rise as demand increases. Uncertainty in the petroleum industry, however, does cloud the future. New uses of bentonite for environmental containment projects may increase demand in the future.

The Wyoming Department of Environmental Quality has let contracts for the reclamation of abandoned bentonite pits in the Colony bentonite mining district in Crook County. This work will continue through the remainder of 1985.

Trona

Wyoming's trona mining industry continues to struggle with overcapacity and a near stagnant market. Soda ash prices, however, may have reached their low in mid-1984 and may increase somewhat in 1985, reflecting a trend that began at the end of 1984.

FMC announced plans to lay off 76 workers by October 1985. Soda ash (refined trona) is used primarily for the production of container (bottle) glass, a market that is diminishing due to the increased use of plastic bottles. Exports, which currently account for 19 percent of domestic soda ash production, offer promise as a way to increase production. Recent negotiations with China also offer some optimism.

In a surprise move, Allied Chemical announced the closure of its synthetic soda ash plant in Syracuse, New York. Only last quarter, Allied had laid off employees because of planned production increases from the same synthetic plant. Producers of natural soda ash in southwestern Wyoming expect to pick up most of the 500,000-ton-per-year demand attributable to the closure of Allied's New York plant.

FMC is also expecting to start producing soda ash from its newly developed in situ field south of its Westvaco plant. Industry experts expect that in situ mining will be 25 percent less expensive than conventional underground mining. It is also less labor-intensive and will not increase employment proportional to increased production.

Other Industrial Minerals

The production of construction materials (sand and gravel, gypsum, limestone mined for cement, stone, ballast, and baked and fused rock [clinker]) should increase in the remainder of 1985 as construction in Wyoming increases.

Limestone production for sugar refining has declined in Wyoming and is expected to continue declining in 1985. In fact, most of the limestone produced by Holly Sugar at its Lost Day Quarry north of Fort Laramie is shipped to the Laramie River Station Power Plant for use in emissions control.

The production of other industrial minerals depends on the economy and should increase in the remainder of 1985. These other industrial minerals include clay and sodium sulfate.

The Geological Survey of Wyoming has released information on the occurrences of baked and fused rock (clinker) in the Powder River Basin. In this area, clinker is often the best material for construction aggregates. Three 1:250,000-scale maps covering the Gillette, Newcastle, and Sheridan 1° x 2° AMS map areas have been released as Geological Survey of Wyoming Open File Reports 85-5, 85-7, and 85-8. The maps, by John E. Meyer, are available from the Wyoming Geological Survey at $3.00 each.

The Geological Survey also released Open File Report 85-2, Selected references on construction materials in Wyoming. This report lists sources of information for construction materials, indexed by commodity. The report by Ray E. Harris and John E. Meyer is available for $2.25.

Ray E. Harris, Uranium and Industrial Minerals Geologist, Wyoming Geological Survey.

OIL AND GAS UPDATE

Final 1984 oil and gas production totals were recently released by the Wyoming Oil and Gas Conservation Commission. Oil production was 127,763,146 barrels, up 5 percent from 1983; natural gas production was 600,137,792 mcf, up 11 percent from 1983. This makes the second year in a row that oil production has shown an increase after several years of steady decline. Although gas production had been increasing fairly steadily over the last several years, the increases of the past two years have been more significant.

In a recent report by the Potential Gas Committee, it appears that "disappointing" results in recent exploratory drilling in the Overthrust Belt area and the Wind River Basin have contributed to a drop in estimated natural gas reserves for the nation. The group revised its 1982 estimate for these two areas downward from 60 trillion cubic feet to 31 trillion cubic feet. Results of drilling in the areas of the Overthrust Belt, exclusive of southwestern Wyoming and northeastern Utah, have been especially disappointing, according to the group. Its estimate of "potential supply" (what could additionally exist in known fields, what might exist in other areas with favorable geology, and what is recoverable with current technology) for the nation fell from 876 trillion cubic feet to 784 trillion cubic feet.

Subsidiaries of Williams Company and Tenneco, Inc. recently announced plans to construct a 762-mile-long, 36-inch carrier pipeline from Kemmerer, Wyoming, to Bakersfield, California. Natural gas from the Overthrust Belt would be transported to fuel thermal projects in California's heavy oil and tar sand fields.

Falling gasoline prices and scheduled decreases in the amount of lead permitted in gasoline are having a devastating effect on small refineries in the Rocky Mountain area and the nation as a whole, according to the Intermountain Oil Marketer Association. Using non-lead formulations to boost octane levels in gasoline is quite expensive and small refineries, which tend to be older, require expensive remodeling to meet new standards. As a result, many have closed and more closures are anticipated. In Wyoming, eight of the smaller refineries have already closed, leaving only the larger refineries in Sinclair, Casper, Cheyenne, and Gillette still operating. Of the 29 refinery closures across the nation in 1984, 28 were smaller refineries, according to the Oil and Gas Journal.

A growing list of groups and agencies are coming out in opposition to the renewal of 31 oil and gas leases in the Bridger-Teton National Forest near Grand Teton National Park. Jack Stark, superintendent of Grand Teton National Park, recently indicated his opposition to the lease renewal. He is joined by various environmental groups, the Jackson Town Council, the Teton County Commissioners, the Wyoming Wildlife Federation, and the Outfitters and Guides Association. The hydrocarbon potential of this area is relatively untested at this time.

The Bureau of Land Management (BLM) has recently announced that it will relax penalties for minor oil and gas lease violations while it reviews the controversial Federal Oil and Gas Royalty Management Act (FOGRMA) regulations adopted last October. The BLM set a one-year grace period for minor violations. A task force will draft a revised set of regulations, taking into account numerous public comments and industry objections. They also intend to examine the agency's inspection and enforcement strategies. Industry especially objected to rapidly escalating fines that could reach $25,000 per day.

A June public hearing on Wyoming's proposed new oil and gas lease form indicated that there was still significant disagreement between the state and the petroleum industry. Although industry objections centered on the royalty provisions of the form, there were objections to many other portions of the proposed form as well. The State Land Board listened to a full day of testimony in opposition to provisions of the form. The record was left open so that written testimony could be sent in, and Governor Herschler, board chairman, asked for briefs on the legality of the "single payor" clause in the lease. Several persons testified that if the

form were not materially changed, it would dampen or even eliminate interest in leasing state lands. Copies of the proposed lease form are available from the Commissioner of Public Lands, Herschler Building, 122 West 25th Street, Cheyenne, Wyoming, 82002-0600, or call (307)777-7331.

The BLM recently approved Marathon Oil Company's plans to drill a controversial oil well in the mountains west of Cody. Personnel and equipment for the 5,000-foot test will be brought in by helicopter to prevent damage to the scenic area. Even with helicopter mobilization, the Park County Resource Council indicates it will go to court to restrain Marathon from drilling.

The BLM estimates that at least 107 townships in Campbell County need to be resurveyed because of major discrepancies between original and later surveys. The BLM discovered that royalties for several mislocated oil and gas wells may have been paid to the wrong persons or government entities. A BLM report estimates that it will take 22 years to resurvey the area. There is considerable concern over the matter since the question of ownership and mineral rights could have a deleterious effect on oil and gas development in the Powder River Basin, which is the most active basin in Wyoming at this time.

Ronald Terry, co-director of the Enhanced Oil Recovery Institute at the University of Wyoming, indicated recently that approximately 1.5 billion more barrels of Wyoming oil are recoverable with available enhanced recovery techniques. About one-third of that could be recovered over the next 30 years. Terry was one of several speakers at the first "Wyoming Enhanced Oil Recovery Symposium" sponsored by the University of Wyoming and held recently in Casper.

In the May 21 oil and gas lease sale held by the State of Wyoming, the high bid was submitted by Charles Kerr at $350 per acre for a 160-acre tract in northern Campbell County. High bids at the sale totaled $936,373.70. The average bid per acre was $26.55. One hundred seventeen of 199 tracts offered for lease received bids.

Exploration in the Overthrust Belt is again in the news. Unconfirmed reports indicate Mesa Petroleum has completed a discovery in Jurassic Nugget Sandstone just south of the town of Evanston. Details have not been released, according to Petroleum Information Corporation. Also, Amoco Production announced the completion of a Triassic Thaynes discovery just north of Chicken Creek Field approximately seven miles southwest of Evanston. The well flowed gas at 589,000 cubic feet per day from a depth of 15,700 feet. The nearest Thaynes production is 22 miles to the north in the Whitney Canyon - Carter Creek area.

The Powder River Basin continues as the dominant site for oil exploration activity in the state. Several new discoveries have been completed, the most significant being a prolific Frontier oil discovery by Jerry Chambers Exploration 25 miles northeast of Casper in the Sand Dunes Field area. The well flowed 1,100 barrels of oil and 2.2 million cubic feet of gas from below 11,000 feet.

The importance of the Minnelusa play in the Powder River Basin is illustrated in a recent Petroleum Information article which listed 45 rigs working in the Powder River Basin, as compared to 57 rigs in the Bighorn, Wind River, and Green River basins combined. Activity in Campbell County is especially high, with 186 wildcats completed through April of this year. Of these completions, 23 opened new fields and 17 tapped the Minnelusa at depths ranging from 7,000 feet to 15,000 feet, according to an article by Irving Garbutt in the May issue of Western Business.

Alan J. VerPloeg, Petroleum Geologist
Wyoming Geological Survey

COAL UPDATE

The assessed value of the 130.7 million tons of coal produced in Wyoming in 1984 was about $1.23 billion, an increase over 1983's $1.15 billion. Taxable production, which is less than acutal production because federal and state royalties (converted to tons) are not included, was 125.9 million tons, an increase of 18 million tons over 1983's 107.9 million tons. Despite coal's increased total valuation, the average value per ton has decreased for the second consecutive year. After reaching an all-time high value of $10.71/ton in 1982, the value dropped to $10.67/ton in 1983 and $9.77/ton in 1984. This 8 percent decrease in average value per ton reflects the increased production of lower cost coal from the Powder River Basin. Only low-Btu lignites from Texas and North Dakota are cheaper than coal from the Wyoming portion of the Powder River Basin.

In the last few months, the future of coal mining operations in the Hanna Basin of south-central Wyoming dimmed further. In May, Arch Mineral Corporation announced it would shut down its dragline at Seminoe No. 1 (laying off 12 of the 39 workers presently employed at the mine) by the end of the summer. Medicine Bow Coal Company, a subsidiary of Arch and Union Pacific, also announced the end of coal production from its Medicine Bow Mine in July when a contract with Iowa Public Service expires. The companies have been unable to secure any new coal contracts for these two mines. This will leave Arch with only one operating mine in the basin, the Seminoe No. 2 Mine; the company is still negotiating to renew a 1.5- to 2.0-million-ton-per-year contract for coal from this mine.

The future of the state's only underground coal mine, Carbon County Coal Company's Carbon County No. 1, is also very uncertain at this time. This mine, also located in the Hanna Basin, was notified by its sole customer, Northern Indiana Public Service Company (NIPSCO), that it would not take coal from the mine after May 20, 1985. Subsequently, NIPSCO filed suit in U.S. district court in Hammond, Indiana, to break the utility's 20-year contract with the mine. NIPSCO's suit alleged that price escalations in the last seven years had boosted the price of coal at the mine from $24.33 to $43.44 a ton and that a two-year supply of

Carbon County coal is stockpiled at the plant because it is too expensive to use in generating power at the utility's Schahfer No. 14 plant at Wheatfield, Indiana. A preliminary injunction filed by Carbon County Coal Company to temporarily continue the shipments to NIPSCO was issued shortly before the May 20 deadline. Hearings continued on another preliminary injunction filed by Carbon County Coal to continue coal deliveries until the lawsuit filed by NIPSCO goes to trial later in the year. Meanwhile, negotiations attempting to settle the contract dispute continue. If NIPSCO is successful in voiding its contract with Carbon County Coal, many observers feel that the mine would be forced to close, laying off nearly 300 miners and severely impacting the town of Hanna, as well as Carbon County.

Two other Wyoming coal companies, Black Butte and Big Horn (both affiliates of Peter Kiewit Sons), recently won federal court cases filed against them by their major contract coal customer, Commonwealth Edison. The Illinois utility had attempted to use a contract provision to decrease its coal deliveries from the Black Butte coal mine east of Rock Springs from 5.9 million to 4.4 million tons per year over a 10-year period (1989-1999). Commonwealth Edison had argued that the coal from Black Butte was of poor quality and was jeopardizing its environmental operating permit. The jury found that the utility did not have good reason to reduce its contracted demand and that the utility would have to accept the 15 million tons of coal, worth about $450 million. The jury also awarded Black Butte $13,348 in damages because the utility did not pay full price for some of the coal delivered, but denied another damage claim to Black Butte for coal that was refused at the utility's plant because of an equipment breakdown.

Big Horn Coal Company, which operates a surface mine just north of Sheridan, was awarded $492,868 in damages from Commonwealth Edison for coal the utility did not buy because of an equipment problem at its plant in Waukegan, Illinois. Big Horn also was awarded $237,020 in damages because the utility did not pay full price on some of the delivered coal. Commonwealth Edison is involved in five other lawsuits against Kiewit affiliates. Some observers have noted that Commonwealth's growth rate has slowed from 7.6 percent to about 1.5 percent (creating a coal oversupply that reportedly will exceed 33 million tons by 1994) and that four new nuclear reactors due to begin operation in the late 1980s will alter the utility's fuel needs from 50 percent coal to 30 percent coal by the late 1980s.

In coal contract news, Kansas City Power and Light Company announced in late March that Rochelle Coal Company, a wholly-owned subsidiary of Peabody Holding Company, had been awarded a contract for 10.8 million tons of coal over 14 years beginning in April 1986. The coal would come from the Rochelle Mine (located between the North Antelope and Black Thunder mines), which is currently under construction. The coal would be delivered to the utility's Hawthorn and Montrose generating stations in Missouri. Rochelle also has a coal supply contract with Northern States Power Company in Minnesota.

Carter Mining Company (a subsidiary of Exxon Coal USA) recently signed a six-month contract for 200,000 tons per month with the City of Austin, Texas, and the Lower Colorado River Authority. The coal from Carter's Caballo Mine will be used to replace coal from a recently cancelled contract the utilities had with the Decker Mine in Montana. The published cost of the coal is $4.98 per ton (F.O.B. mine), with transportation charges of $22 per ton. Wisconsin Power and Light, which began accepting coal for its new Sheboygan Plant from Thunder Basin Coal Company's Black Thunder Mine in March of this year, appears to have chosen this mine for a 1.2-million-ton-per-year contract for its plant at Columbia, Wisconsin. Although no final contract has yet been announced, the utility has accepted temporary shipments to the plant via the Chicago and North Western Transportation Company. The railroad company is also hauling the coal on a temporary basis.

Competition appears to be keen for a 2.5-million-ton-per-year coal contract and a coal transportation contract for Northern States Power Company's new 800-megawatt Sherio 3 generating plant in Minnesota. This contract is significant because three Montana coal companies (traditional suppliers to this market area) are in competition with four Wyoming coal producers. The State of Montana recently passed legislation reducing severance taxes on coal produced under new contracts signed or extended between January 1, 1985 and June 30, 1987. If a Montana company wins this contract, it may demonstrate that a reduction in the current 30 percent severance tax rate in Montana can help that state's coal industry and would lend support to those favoring a permanent coal tax reduction in Montana.

In coal transportation news, both the Chicago and North Western Transportation Company (C&NW)/Union Pacific (UP) joint venture and the Burlington Northern (BN) have recently announced new coal transportation contracts for coal haulage out of Wyoming. The fifth major contract signed by the C&NW/UP venture is with the City Public Service Board of San Antonio, Texas, to haul 3.3 million tons of coal from the Cordero Mine via a new spur line (to Coal Creek Junction). Cordero hopes to complete the new line by October 1985. The joint venture also signed a six-month contract with the Lower Colorado River Authority to haul 0.75 million tons from the Black Thunder or Coal Creek mines to LaGrange, Texas. Evidently, negotiations are continuing for a longer term contract.

Burlington Northern has been very active in securing several long-term transportation contracts, including a 15-year contract for 8.7 million tons per year with Utility Fuels/Houston Lighting and Power, a 28-year contract for 8 million tons per year with Kansas Power and Light, and a 17-year contract with Southwestern Public Service Company of Amarillo, Texas. The railroad company also signed a three-year, 3-million-ton-per-year contract with Grand River Dam Authority to transport coal to Pryor,

Oklahoma, and a three-month contract with the Lower Colorado River Authority to transport coal to Fayette, Texas.

In other market news, it now appears that the Dry Fork Coal property located between the Fort Union and the Eagle Butte mines north of Gillette is on the sales block again. Phillips Petroleum Company, which had acquired the property several years ago from Cities Service Corporation, was proceeding with a mining permit at the time the decision was reached to sell the property. The Dry Fork property reportedly contains about 350 million tons of coal reserves and is being sold along with Phillips lignite properties in other states in an attempt to raise funds to pay off debts resulting from Phillips' successful defense against corporate takeover last year. Phillips purchased the property in late 1982 when Cities Service, in a move similar to that taken by Phillips, began liquidating its assets to reduce the debt that was incurred when Cities Service was absorbed by Occidental Petroleum. In 1980, Cities Service acquired the property, which reportedly includes 5,000 acres of coal under lease and 7,600 acres of surface rights, from Peabody Coal Company for $77 million. The property is rumored to have cost Phillips only $20 million.

It was also announced in March that the U.S. Synthetic Fuels Corporation had eliminated World Energy Corporation's proposed Byrne Creek in situ gasification project in western Wyoming from competition for federal subsidies to aid in its development. The project was one of five projects dropped by the Synfuels Corporation, primarily because the corporation felt that the technology for these projects was so close to commercial development that private industry could use the technology without government subsidies.

In federal coal leasing, several developments are of interest. On April 30, a competitive emergency coal lease sale was held in Cheyenne. The lease area, known as Tract 98, encompasses 164.81 acres of coal adjacent to Pittsburg and Midway Coal Mining Company's Kemmerer Mine in western Wyoming. The tract contains six minable coal beds, with total in-place reserves of 3.8 million tons. Pittsburg and Midway was the apparent high bidder, with a bid of $910 per acre, or a total bonus bid of $150,150. Energy Alliance Partnership W-85 of Houston, Texas, submitted the only other bid on the tract. Also of interest, although not directly affecting Wyoming coal leasing, was the May 30 ruling by a U.S. district court judge in Billings, Montana, that voided the 1982 coal lease sale of Montana coal tracts. The judge decided that the environmental impact statement, which was written prior to the lease sale, did not address potential social and economic effects of the lease sale on the Northern Cheyenne Indians. Western Energy Company, the winning bidder on three of the tracts, had already begun mining on two of the tracts at its Rosebud Mine near Colstrip.

Of interest to Wyoming, both the Powder River Basin and Green River/Hams Fork regional coal teams met in June in response to coal leasing interest. No timetables for renewed leasing have been announced as a result of the meetings.

Dick Jones, Coal Geologist,
Wyoming Geological Survey

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Summer Agricultural Outlook

Low commodity prices and potential drought face Wyoming's agricultural producers as we move into the summer of 1985. Many areas of the state have been forced to move cattle to rented pastures, and in some instances, to market as rainfall has been 50 percent to 60 percent of normal. Low livestock prices have prevailed most of the spring, as large meat supplies and falling prices for finished cattle push average producer returns below break even.

LIVESTOCK HIGHLIGHTS

Large meat supplies and sharply lower choice steer prices prevailed this spring, as cattle feeders held finished cattle off the market in anticipation of stronger prices. Dressed carcass weights averaged 644 pounds for the first four months of the year, up 15 pounds from a year earlier. Average daily slaughter is around 130,000 head, thus a sharp increase in supply results even if slaughter numbers remain constant. Beef cow slaughter has remained above a year ago, as the nation's producers have continued the herd liquidation begun in 1982. The persistent high level of beef cow slaughter suggests further declines in the 1985 cattle inventory. The 1985 calf crop is expected to be lower than the previous year for the fifth consecutive year.

Choice fed steer prices were pressured downward throughout the spring. Omaha prices averaged $59.58 cwt for March and $62.24 for the quarter, down from the $67.58 for the first quarter a year earlier. Retail prices remained relatively stable, but wholesale carcass prices declined sharply to about $86 a cwt by early May. This is the lowest price since 1979. The price spread between yield grade 3 and 4 carcasses widened to $20 a cwt, indicating burdensome supplies of overfinished carcasses.

Choice steer prices should begin improving in July, as overfinished cattle get cleaned out of feedlots. The major portion of the summer cookout season should keep demand relatively strong. Retail prices can remain relatively stable even as live cattle prices rebound, through a narrowing of the farm-to-retail price spread. Feedlot operators tend to cut back on placements when current prices decline, and this often leads to reduced supplies at a later date. This happened last spring, so some counter-seasonal price strength should materialize this summer and fall.

The price outlook for feeder yearlings and calves this fall is somewhat bullish, given current prices. Competition for the reduced supply of stockers and feeders, coupled with low feed grain prices should push prices $2 - $5 per cwt above year earlier levels. Improved fed cattle prices linked with lower than normal pork supplies should also lend price strength to cattle moving from Wyoming pastures this fall.

CROP HIGHLIGHTS

Despite 20 million acres of the national wheat acreage base being idled under the acreage reduction program, 1985's wheat output looks to be only slightly below 1984. This negligible cutback will maintain supplies somewhat below the 4 billion bushels of the last three seasons. Confronting this overbearing inventory is the prospect of a decline in demand.

Domestic use may fall since wheat feeding is down from 1984/85. Also, the U.S. export potential is not particularly bright unless the value of the dollar declines sharply. For world wheat, 1985/86 is expected to resemble the past three years: record global production outpacing consumption, leaving ending stocks at new highs. Total exportable supplies of the five major exporters are anticipated to rise for the sixth consecutive year. World demand for wheat, however, may be reduced because of a large anticipated harvest in the Soviet Union and China.

Domestic feed grain stocks as of April 1 totaled 5.5 billion bushels, more than enough to cover domestic and export needs for the rest of the season. The 1985 corn crop is forecast at 7.8 billion bushels, 3 percent above 1984. Total feed grain supplies for 1985/86 are forecast up 8 percent from 1984/85 because of large current inventories and projected production. Exports are expected to decline and domestic use should rise only slightly, with the number of grain-consuming animals remaining about steady.

Robert D. Carver, University of Wyoming

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Job Openings Outlook

Medical Record Technicians

Medical record technicians compile and maintain the medical records of hospital patients. They analyze and code information, review records for accuracy and completeness, and prepare reports. In larger hospitals, medical record technicians often supervise medical record clerks and report to the medical record administrator. Although hospitals are the largest employers of medical record technicians, some are also employed by clinics, nursing homes, health maintenance organizations, and government agencies.

Most employers require an Associate Degree in Medical Record Technology. Since there are no accredited programs in the state of Wyoming at this time, most medical record technicians receive their training out of state or through correspondence study through the American Medical Record Association. To be accredited, an applicant must have successfully completed an independent study program or academic program approved by the American Medical Association and/or the American Medical Record Association and pass a national examination. For more information on the independent study program, or accredited college programs, contact the American Medical Record Association, John Hancock Center Suite 1850, 875 North Michigan Avenue, Chicago, Illinois, 60611, Phone: (312)787-2672.

Employment for accredited medical record technicians is favorable nationwide. New government regulations concerning Medicare and Medicaid are increasing the demand for medical record technicians. Nationally, the demand for workers is likely to exceed the supply for years to come because of increased use of health insurance and because of increased numbers and types of facilities which must have health records systems.

In Wyoming, the demand for medical record technicians is not as great as the rest of the country. This is due to very low turnover and the need for only one or two technicians in most of Wyoming's hospitals. Employers indicate that a willingness to begin on an evening shift and accept lower-than-average wages may improve chances for employment in this field.

Beginning salaries for medical record technicians range from about $15,000 to $25,000 a year. Maximum annual wages are between $25,000 and $30,000 a year. Medical record technicians working in small facilities, or unaccredited technicians, earn less.

Shorthand Reporters

In Wyoming, employment for shorthand reporters depends on availability of training, the number of civil and criminal cases coming to court, the use of mechanical recording equipment in the courtroom, and the replacement of those who leave the occupation. Opportunities are best for those reporters who have established a good business reputation and clientele.

In most areas of the state, there is a balance to slight shortage of shorthand reporters. Cheyenne, however, is experiencing a surplus of applicants. Nationally, there are more people being trained than there are positions. Sources indicate that permanent court reporting positions are difficult to obtain because they are usually not entry level positions. As automated recording and word processing increases productivity of existing reporters, employment growth will be limited.

Shorthand reporters can specialize in three different areas. First, they can be an official reporter who is employed by the court system. Second, they can be a free-lance reporter who is employed by client-attorneys to take depositions, and by anyone who desires a verbatim record of a meeting or event. Third, they can be employed as an administrative hearing reporter working for county, state, or federal government agencies.

Most employers of shorthand reporters require graduation from an approved court reporting school and a certificate of proficiency. Hiring channels include personal contacts such as fellow court reporters, attorneys, shorthand school instructors, and professional organizations. Official court reporters are selected by the judge in whose court they work. Employers also indicate that speed, skill, and accuracy are the major factors used as selection criteria. A speed greater than 225 words per minute will most likely ensure employment.

In general, two years of specialized training is necessary to acquire the knowledge, skills, and speed required to enter this occupation. Many reporters gain experience by doing part-time work for courts or by doing hearings reporting work before establishing permanent court reporting positions.

Salaries for shorthand reporters vary according to court and geographic location. Entry wages range from $18,000 to $30,000 a year. Average maximum wages are between $25,000 and $50,000. It usually takes five to 10 years to reach the maximum pay level. Free-lancers are paid on a percentage of work done and average about $24,000 a year.

For further information, contact Tammy Argyle, Wyoming Career Information System, Box 3808 University Station, Laramie, Wyoming 82071, (307)766-6189.

Tammy Argyle, Wyoming
Career Information System

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Wyoming Coincident Indicators Index

The Wyoming economy slipped a notch during first quarter 1985, as indicated by the Wyoming Coincident Indicator Index (WCII). The WCII, computed by the Division of Research and Statistics, Department of Administration and Fiscal Control (DAFC), is derived using economic variables whose movements generally coincide with movements in the overall economy.

The WCII, computed by the Division of Research and Statistics, Department of Administration and Fiscal Control (DAFC), is derived using economic variables whose movements generally coincide with movements in the overall economy. It is a composite index which uses four economic variables: 1) Wyoming total sales and use tax collections in 1972 dollars; 2) Wyoming state total insured wages paid in 1972 dollars; 3) Wyoming state total employment; and 4) an industry index comprised of one economic variable from each of Wyoming's three major industries. The three industries are agriculture, mining, and tourism, and the respective variables are: 1) prices received by Wyoming farmers and ranchers for all commodities; 2) Wyoming drilling rig count; and 3) Wyoming motor fuel gallonage sales. The historical period over which the index is calculated is January 1972 to March 1985.

Presented on the accompanying graph are the plots for three time series: One for the index using seasonally adjusted data, one for the index using data which has not been seasonally adjusted, and one for the U.S. Coincident Indicator Index. The unadjusted index is presented to show the seasonality of the Wyoming economy. The U.S. index is shown in order that it might be compared to the Wyoming index. The more important Wyoming index, and the one with which all further analysis and description will be concerned, is the seasonally adjusted index. In this index, turns up and down are caused by factors other than seasonality. The base month is January 1972, which has an index value of 100. An index value doesn't have any meaning in and of itself but is valid only when compared to another value from the same index.

The seasonally adjusted index fell 1.38 index points, or approximately 1 percent over the quarter, while the unadjusted index fell 2.93 index points, or 2.34 percent. The U.S. Coincident Index fell only .2 of a point over the same period.

The fall in both Wyoming indices was caused by decreases in almost all of the variables used in computing the index. First quarter 1985 employment, wages, sales and use taxes, and drilling rig count were all down not only from the first quarter of 1984 but also from the previous quarter, (fourth quarter 1984). Prices received for all agricultural products showed the only improvement from last year, while gasoline sales held their own against last year's sales.

Decreases in the unadjusted data series from the fourth quarter to the first quarter aren't unusual, they simply reflect Wyoming's seasonal economy. But decreases in the unadjusted data series from the first quarter of 1984 to the first quarter of 1985 suggest a downturn in the Wyoming economy. This downturn is reflected in the seasonally adjusted index, which registered a decline after the effects of seasonality had been removed. A downturn of only 1.38 index points cannot, however, be considered a serious downturn. Expected increases in employment through the warm weather months ahead should bolster the state's economy and hopefully provide an upswing in the second and third quarter seasonally adjusted indices.

Steve Sommers, DAFC

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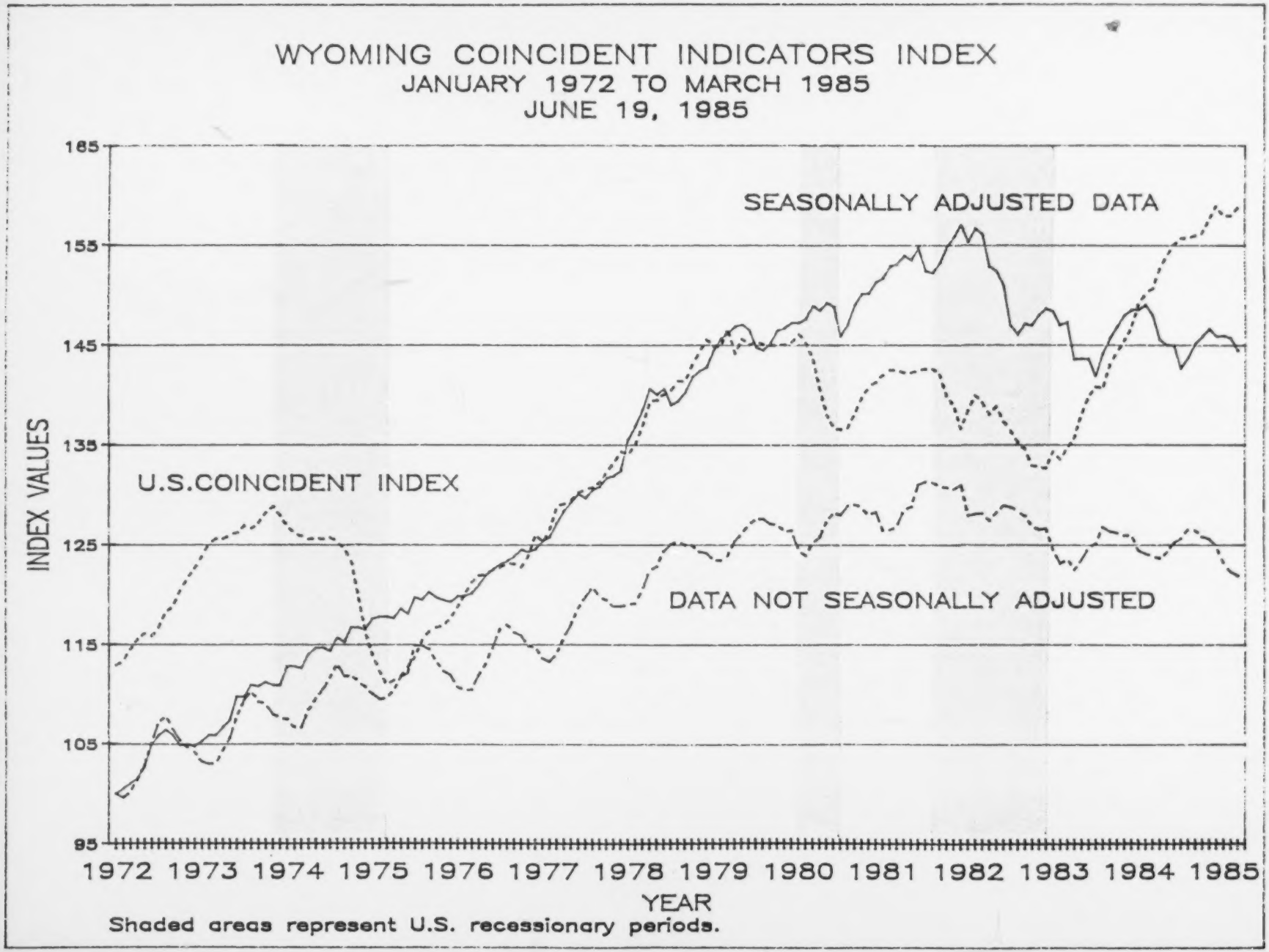

WYOMING COINCIDENT INDICATORS INDEX
JANUARY 1972 TO MARCH 1985
JUNE 19, 1985
INDEX VALUES
165
155
145
135
125
115
105
95
SEASONALLY ADJUSTED DATA
U.S.COINCIDENT INDEX
DATA NOT SEASONALLY ADJUSTED
1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985
YEAR
Shaded areas represent U.S. recessionary periods.

INDUSTRY PROFILE

A Wyoming Construction Review

INTRODUCTION

They come with hammer and shovel, rigging and scaffolds, coming like army ants, coming to build. In their wake, they leave the stuff of civilization, the buildings and monuments, the edifices of the age. They are the builders, the men and women of the construction crafts, welders and pipefitters and laborers, builders of railroads and power plants and highways, who come in a summer season and are gone with the leaves of autumn, leaving the fruits of their labors to technicians and 30-year men.

The purpose of this article is to describe the construction sector of the Wyoming economy. This is accomplished first by examining the sector overall and then by focusing on heavy construction projects that have played important roles in the history and economic development of the state.

OVERVIEW

Construction is often viewed as an industry, but it probably is most appropriate to consider construction an economic sector since it is not a single activity but a group of activities loosely related by products, technologies, and institutional settings. The products of the construction sector vary widely, including such massive structures as power plants and such modest efforts as home improvements. In total scope, the construction sector embraces new building activity as well as maintenance and repair work.

In 1983, the construction sector employed 22,356 persons, according to data compiled by the Wyoming Information Coordinating Committee, fifth largest among all Wyoming economic sectors. Construction sector employment represented 9.4 percent of total state employment.

According to the Wyoming Employment Security Commission, the construction sector is expected to increase to 28,415 workers by 1990. Average wages for covered employment are $381.80 per week, about 10 percent above the statewide average.

Bureau of Economic Analysis data indicate that total wage and salary disbursements in the construction sector decreased from a high of $460 million in 1981 to $276 million in 1983. Heavy construction disbursements declined from $244 million to $118 million between 1982 and 1983.

Wage and salary disbursements in recent years have been strongly influenced by heavy construction, which continued to lead the way even at the bottom of the recession in 1983. Heavy construction, in turn, has closely tracked the mining sector in recent years (see graphs. Earnings include wage and salary disbursements, other labor income, and proprietors' income).

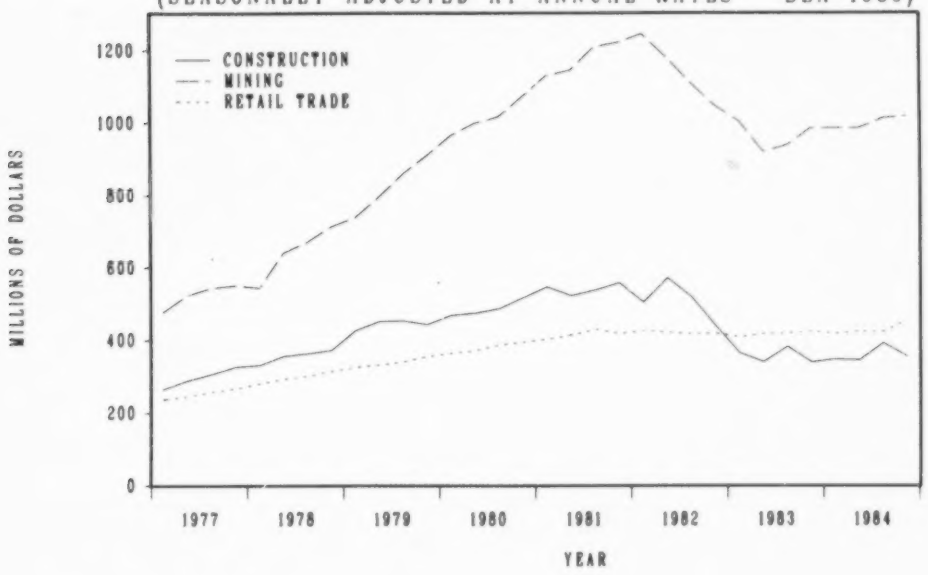
Statistics aside, the total impact of construction activity on the Wyoming economy is somewhat difficult to gauge. Activity created by construction work, such as in the wholesale and retail sale of building products, often do not appear as construction-related figures. Because of the secondary effects of construction, however, it is probably most fitting to consider construction (especially heavy construction) a basic sector of the Wyoming economy.

HIGHWAY CONSTRUCTION

In general, the major highways crossing the state are part of either the Federal-Aid Highway System or the State Highway System. Smaller roadways, such as city streets, fall within other designations. Highways that are part of the federally-sponsored system were constructed as a means of promoting the general welfare and providing for the common defense, as prescribed by the U.S. Constitution.

When completed, the full Interstate Highway System in Wyoming will cover a distance of 914 miles. The Interstate System consists of three highways: I-25, running north-south for a distance of 301 miles from the Colorado border to near Buffalo; I-80, running east-west from Nebraska to Utah, for a total of 403 miles; and I-90, entering the state northwest of Sheridan and leaving the state east of Sundance, for a

WYOMING: EARNINGS BY SELECTED INDUSTRIES
(SEASONALLY ADJUSTED AT ANNUAL RATES - BEA 1985)



WYOMING CONSTRUCTION: WAGE AND SALARY DISBURSEMENT
(BEA 1985)

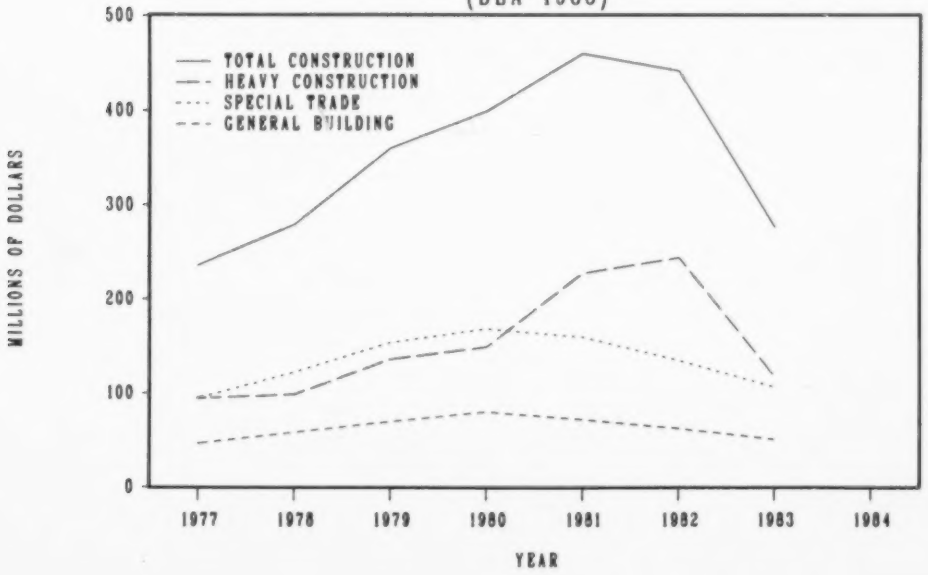


Table 1: Total Expenditures for Construction on State-administered Highways in Wyoming, 1944-1983 (Thousands of Dollars).

Year	Amount of Expenditure	Year	Amount of Expenditure
1944	($) 1,029	1964	($) 53,111
1945	1,194	1965	50,015
1946	4,818	1966	47,689
1947	7,651	1967	49,856
1948	9,955	1968	50,123
1949	8,700	1969	46,441
1950	8,265	1970	47,630
1951	8,565	1971	46,463
1952	10,493	1972	50,431
1953	9,953	1973	36,828
1954	11,232	1974	48,048
1955	13,478	1975	78,480
1956	16,946	1976	70,413
1957	26,728	1977	59,616
1958	34,490	1978	82,558
1959	35,860	1979	103,497
1960	32,296	1980	128,658
1961	36,280	1981	124,812
1962	40,221	1982	121,420
1963	43,495	1983	152,819

Table 2: Total Expenditures for Maintenance on State-administered Highways in Wyoming, 1944-1983 (Thousands of Dollars).

Year	Amount of Expenditure	Year	Amount of Expenditure
1944	($) 1,095	1964	($) 4,853
1945	1,180	1965	4,908
1946	1,280	1966	5,875
1947	1,760	1967	6,148
1948	3,103	1968	6,390
1949	2,612	1969	7,661
1950	3,329	1970	8,461
1951	2,745	1971	8,668
1952	2,954	1972	8,430
1953	3,599	1973	10,804
1954	3,501	1974	13,422
1955	3,251	1975	15,658
1956	3,662	1976	15,721
1957	3,564	1977	19,445
1958	3,896	1978	19,292
1959	4,518	1979	25,040
1960	3,506	1980	30,121
1961	4,524	1981	34,095
1962	4,862	1982	38,393
1963	4,502	1983	45,871

Sources: U.S. Department of Transportation. Highway Statistics, Summary to 1975. Washington, D.C.: Federal Highway Administration.

U.S. Department of Transportation. Highway Statistics, 1976-1983. Washington, D.C.: Federal Highway Administration.

total distance of 209 miles.

The state's primary and secondary roads were designed under federal auspices to serve motorists through systems of city-to-city, interstate, and in-state highways. A 1921 federal law limited the primary road system in each state to 7 percent of a state's total highway mileage. However, the law permits this limitation to be exceeded as the original primary system nears completion.

The state secondary road system is a federally supported program which allowed roads to be selected cooperatively by the State Highway Department and local road officials. Secondary roads include farm-to-market roads, rural mail routes, school bus routes, and similar roadways.

The newest of the federal-aid highway programs is the Urban System, established in 1973. The purpose of the program is to serve major centers of activity within a state. Under the program, routes are selected by local road officials, with the approval of the State Highway Department.

The State Highway System is an open-ended road network, which may overlap in part or in whole the Federal-Aid-Highway System, county roads, city streets, or other roadways. Roads in this system receive at least partial support from the Wyoming Highway Fund.

Other roadways in the state include county roads, city streets, Indian reservation roads, forest highways, and industrial roads. Methods of support vary. Industrial roads, for example, are built jointly by the state and county, with each contributing 50 percent of the construction cost.

Intensive efforts to construct and upgrade Wyoming's roadways began in 1917, when the Wyoming Highway Department was created by the state legislature. The same year, Wyoming received a $61,200 payment on its first highway appropriation totaling $5 million. By comparison, the State Highway Department spent $176 million on road construction during 1984. Approximately 70 percent of the department's annual budget is spent on construction projects.

In the early days of state highway development, construction was hampered by inadequate funding and stringent regulations that required specified federal-state matching ratios. In addition, considerable time was required to complete surveys and obtain the necessary rights-of-way before construction could commence. Highway construction equipment also was in short supply.

By the early 1920s, only 524 miles of the state's highway system had been completed, although 40,000 miles of county roads were in existence. Keeping apace with increased vehicle numbers, heavier vehicles, and increased winter traffic posed a continuing challenge during the 1920s. As traffic increased, greater emphasis was placed on bridge design, road maintenance, snow removal, and long-range planning for the entire state system.

During the 1930s, federal and county funds provided the bulk of support for highway construction, although some state funds were expended as well. Major highway projects completed during the 1930s included the Lincoln Highway, the Yellowstone Highway, the Laramie Road, and the Black and Yellow Trail.

During World War II, Wyoming's roads fell into a state of general disrepair, due to manpower and materials shortages. Following the war, the prime concern of the Wyoming Highway Department was to restore deteriorated roadways. Much additional road construction work remained to be done well into the 1950s and did not shift to high gear until initiation of the Interstate Highway Program in 1956.

By the mid-1950s, the nation's highways were increasingly plagued by congestion, rising accident rates, and deteriorated roadbeds. In response to such problems, Congress created the Interstate Highway System, the purpose of which was to link the nation's major metropolitan centers through a system of modern highways.

Work on the Interstate System proceeded throughout the 1960s and 1970s, producing three major roadways in the state (I-80, I-90, and I-25). Final work in the Interstate System could be done this summer, when work is completed on a 10-mile stretch of I-90 north of Sheridan. When completed, the I-90 work will mark the end of a 29-year, $565 million construction effort in Wyoming.

With basic construction work on the Interstate System completed, the focus of the State Highway Department with regard to the system will turn to rehabilitation of existing roadways. Several hundred miles of the Interstate System are approaching, or have already passed, their design lives, and are in need of reconstruction or rehabilitation. This year, rehabilitation of the Interstate System is expected to involve 15 major projects costing $90 million for work on approximately 100 miles of highway.

Like most major construction projects, highway work has resulted in economic benefits for many Wyoming communities. According to some estimates, private contractors spend about one-third of the contract dollar for local materials and services. Another one-third is spent for labor, often hired locally.

RAILROAD CONSTRUCTION

Railroad construction has played a key role in the social and economic development of Wyoming. Railroad building projects spawned many new communities in its wake, many of which failed as quickly as they rose. Others, however, took firm root and today are among the state's major population centers.

The Pacific Railroad Act of 1862 established in law the principle of creating a railway system that would link the nation from ocean to ocean. The act was passed during the Civil War partly as a means for linking together the farflung territories of the Union, a matter which took on added urgency after a Confederate foray into New Mexico threatened Colorado. But the act was also the fulfillment of a national yearning to build a railroad that spanned the continent. To provide a partial subsidy, Congress offered land grants and other incentives to both the Central Pacific and Union Pacific railroads to construct the railway. The terms were liberalized further under a supplemental act passed 1864. Since the

incentives were based on track mileage, a race between the two railroads to lay the most track was the inevitable result.

In an official announcement of December 2, 1863, President Abraham Lincoln designated the eastern terminus of the Union Pacific Railroad and the ground was broken in Omaha. Proceeding slowly at first, but picking up steam as it headed west, the Union Pacific crossed Nebraska in the summer of 1867. Grenville Dodge platted the town of Cheyenne in July of the same year. In short order, a mayor and city council were elected. Since the new community had no jail, the first chief of police was instructed to hold prisoners in irons. Then late in the afternoon of November 13, 1867, the U.P. tracks reached Cheyenne. Before November was out, according to some accounts, Cheyenne had blossomed to a community consisting of 200 buildings and some 2,000 residents.

The explosive growth experienced by Cheyenne was typical of many communities that sprang up as the railroad headed across the state. The U.P. platted new towns, sold lots, and moved on. By August 1868, the tracks reached Benton, described by track laying chief Jack Casement as "certainly the meanest place I have ever been in." It has been asserted that $17,000 worth of lots were sold in Benton during the first few weeks. The tracks then reached out for the Red Desert, and between August and November, crews laid track between Benton and Granger. Men reportedly worked moonlit nights and Sundays to gain time in the race to lay tracks.

Grading crews worked as much as 200 miles ahead of the tracks, supported by a small army of freighters and teamsters. The Union Pacific had thousands of men and horses working on the tracks. Base pay for laborers ran from $2.25 to $3.00 per day.

The whole operation was organized in semi-military fashion. The advance guard of surveyors and locators were followed by a second wave of graders, and then a third wave consisting of the tracklayers. Then came the gaugers, spikers, and bolters. The crews struck three strokes to the spike, 10 spikes per rail, 400 rails to the mile. The work was accomplished mostly by muscle power, occurring as it did in the days before steam shovels or air drills. Black powder and sometimes nitroglycerin were used to quarry rock.

The line itself was laid with 50-pound iron, and later, with 56-pound iron. In mountain sections, ties were fashioned from local timber stands. The basis was 2,400 ties per mile on the plains, 2,640 ties per mile in the mountains, and 2,500 ties per mile west of Laramie. Since speed was of the essence, workmanship was a relatively minor consideration. No effort was made to ballast the track as construction proceeded. The ties were laid on the grade with just enough dirt to keep them in place. Masonry work was also largely deferred. In addition to an emphasis on speed, another reason for deferring masonry work and ballasting was the inability to handle the necessary materials. Every engine and all the railroad's equipment was constantly in motion moving toward the construction front.

On May 10, 1869, the Transcontinental Railroad was joined at Promontory Point, Utah. According to Thomas O'Donnell, a Union Pacific worker who witnessed the driving of the golden spike to commemorate the completion of the project, the privilege of striking the first blow was "given to some lady, whose name I don't know, but she proved a poor 'spiker' and missed it." Thomas Durant for the Union Pacific and Leland Stanford for the Central Pacific then completed the task.

The Transcontinental Railroad not only linked East with West, but it also opened up for development the vast riches of the western interior. The towns along Wyoming's southern corridor remained wedded to the fortunes of the Union Pacific, supplying coal for the railroad's steam locomotives and service for its rolling stock. Settlers also began to spread out from the communities established along the route in search of other opportunities throughout the region.

Another great rail construction project began in Wyoming during the 1890s. In August 1891, the railhead of the Chicago, Burlington and Quincy (CB&Q) reached Gillette. On November 26 of the same year, the line reached Sheridan. Thus, the Powder River Basin with all its diversity of resources was open for development.

The coming of the railroad was an economic boom to the Sheridan area. The railroad provided a means for shipping agricultural products and a reason for full-scale development of coal resources in the area. Edward Gillette, in charge of railroad construction, observed of the region, "Rich soil, the finest supply of good water for domestic and irrigation purposes, the magnificent Big Horn Mountains full of elk and deer, numerous lakes, trout in all the streams, grouse in the valleys, and the whole country underlaid with coal convinced many in the party that this at last was what they had been looking forward to in making their permanent homes. The greatest attractions, however, were the young ladies with whom we became acquainted, so later fully half of the party returned to Sheridan, married, and made this town their permanent abiding place."

Another extension of the line reached Guernsey on June 11, 1900, thus opening up the North Platte Valley. In 1908, the CB&Q acquired the Colorado and Southern Railway, and with it, a stretch of track between Cheyenne and Orin Junction, near Casper. Acquisition of the C&S spurred further construction by the CB&Q. In 1909, worked resumed at Kirby southward through the Wind River Canyon by way of Casper to meet the northern end of the C&S at Orin Junction. The work was completed on October 18, 1914. Only one small portion of track--an 8-mile stretch between Guernsey and Wendover--was now required to tie the system together across the entire state. This final task was completed on December 15, 1915.

The land department of the CB&Q also figured prominently in the development of the West. In 1895, experimental farms were set up to test dryland farming methods. Such demonstrations soon were established in more than 200 locations throughout Colorado, Wyoming, Nebraska, and Kansas.

On March 2, 1970, the CB&Q merged with the

Great Northern and Northern Pacific to become the modern Burlington Northern system.

The construction of the railroads meant continued economic blessings. During the 1930s, for instance, it is estimated that the railroads employed one-eighth of all working persons in the state. Railroad construction, however, ceased in the state during the 1920s; in fact, several small stretches of track were abandoned. The only line built between the late 1930s and the late 1960s was a 75-mile-long stretch of track laid by U.S. Steel Corporation. The line was designed for hauling iron ore from Atlantic City to Rock Springs, where the ore could be transshipped via the Union Pacific to Provo, Utah. Total track mileage in the state stood at 2,008 miles in 1940, decreasing to 1,882 in 1960, then rising again to 1,958 by the late 1960s.

Expanded coal-mining activities in the state during the 1970s also meant new railroad construction projects. Spurs were constructed in both southern and northern Wyoming to facilitate coal hauling to mainline routes. A railroad construction project near Rock Springs served a dual purpose. First, building materials were hauled on the line to the site of the Jim Bridger Power Plant. Once the plant was completed, the line was used to haul coal to the facility.

A major railroad construction project prompted by the state's coal development was a 115-mile-long line built between Gillette and Douglas by the Burlington Northern. The purpose of the line (completed in 1981) was to provide coal-hauling access between the Powder River Basin and utility companies in the Midwest.

In early 1985, Chicago & North Western Transportation Company announced plans to extend its line 10 miles further into the Powder River Basin than previously announced, allowing the line to gain access to three of Wyoming's largest strip mines. The $25-million project would give the railroad, along with its partner, the Union Pacific, greater access to Wyoming's primary coal fields and improve its competitive posture with the Burlington Northern for coal-shipping contracts. The new line would give the Chicago & North Western and the Union Pacific access to the AMAX Belle Ayr Mine, Mobil's Rojo Caballo Mine, and Exxon's Caballo Mine. In 1984, the three mines produced 25 million tons of coal, with the potential to produce 52 million tons per year.

Table 3: Earnings Generated by the Construction Industry[1] (Thousands of Dollars).

	1979	1980	1981	1982	1983	% Change 1982-1983
Albany	12,622	11,962	11,487	D[2]	12,038	-
Big Horn	7,078	7,575	5,886	D[2]	6,211	-
Campbell	48,584	53,214	116,703	130,758	48,936	-62.58
Carbon	18,543	25,413	16,781	16,292	10,984	-32.58
Converse	8,984	13,336	9,521	12,927	8,728	-32.48
Crook	2,488	2,550	2,725	2,661	2,587	- 2.78
Fremont	20,018	24,021	24,596	19,362	21,654	11.84
Goshen	4,875	5,069	4,257	3,026	3,708	22.54
Hot Springs	3,665	6,309	3,468	2,716	3,465	27.58
Johnson	4,700	3,946	3,246	3,381	2,602	-23.04
Laramie	50,817	55,086	47,674	43,959	39,562	-10.00
Lincoln	7,221	9,519	11,514	8,450	11,333	34.12
Natrona	91,597	90,042	91,363	80,913	69,474	-14.14
Niobrara	673	765	772	792	1,453	83.46
Park	14,030	14,668	15,410	14,847	17,181	15.72
Platte	28,486	29,504	14,088	9,996	2,001	-79.98
Sheridan	23,524	21,130	20,727	19,414	19,106	- 1.59
Sublette	5,099	5,617	4,776	4,841	2,678	-44.68
Sweetwater	64,325	74,413	101,335	70,799	33,201	-53.11
Teton	10,772	12,349	13,878	12,836	12,920	0.01
Uinta	4,666	9,627	11,012	24,197	16,899	-30.16
Washakie	6,435	5,879	5,710	6,278	7,122	13.44
Weston	4,271	4,478	3,386	2,140	2,656	24.11
Wyoming	443,473	486,472	540,315	508,175	356,499	-29.85
Rocky Mountain Region[3]	3,565,964	3,651,824	3,884,414	4,048,087	4,090,251	1.04
United States	91,836,000	94,633,000	97,559,000	96,397,000	102,528,000	6.36

[1] Earnings by place of work.
[2] Not shown to avoid disclosure of confidential information.
[3] Colorado, Idaho, Montana, Utah, Wyoming.
Source: Regional Economic Information System, Bureau of Economic Analysis.

In 1984, the Burlington Northern operated on 1,298 miles of track in Wyoming. During the same period, the Union Pacific operated on 758 miles of track, while the Chicago & North Western operated on 306 miles of track. During 1984, the Burlington Northern moved 1,064,130 carloads of Wyoming-origin materials, 1,044,062 carloads of which were coal. The Union Pacific moved 207,479 carloads of similar materials during the period, including 121,953 carloads of coal and 65,860 carloads of chemicals and allied products. The Chicago & North Western hauled 9,548 carloads of Wyoming material during 1984, including 7,583 carloads of stone, clay, and glass products. The line hauled no coal in 1984.

CONSTRUCTION OF WATER PROJECTS

Major water projects in Wyoming have resulted in lasting benefits to the state. Dams and reservoirs provide water for irrigation, hydroelectric power, flood control, and recreation.

Most major water projects in Wyoming are under authority of the U.S. Bureau of Reclamation. Some of the major projects which include significant Wyoming components, or are exclusive to Wyoming, include the Kendrick Project, the North Platte Project, the Minidoka Project, the Colorado River Storage Project. the Seedskadee Project, the Shoshone Project, and the Pick-Sloan Missouri Basin Program.

The Kendrick Project is located on the North Platte River southwest of Casper and includes dams, reservoirs, and power plants. In 1904, the Reclamation Service first investigated lands that are now part of the Kendrick Project in connection with plans to build the Casper Canal, an irrigation ditch along the North Platte River. It was not until 1933, however, that the Public Works Administration authorized funds for the development of irrigation and hydroelectric facilities.

The Seminoe Dam was constructed between 1936 and 1939. The first delivery of power from the associated power plant was made on August 3, 1939. Construction on Alcova Dam was started in 1935 and was completed in 1938. Authorization for construction of the Alcova Power Plant, however, was not given until 1950, under provisions of the Reclamation Project Act of 1939. Power production from the plant started in July 1955.

Major construction work associated with the North Platte Project included both Guernsey and Pathfinder dams. In 1895, Nebraska enacted a law which permitted irrigation districts to assess lands for irrigation improvements. Thereafter, the Federal Reclamation Act (1902) was passed, and the Reclamation Service began studying the North Platte Project.

Pathfinder Dam was one of the first dams constructed by the Reclamation Service. Construction on Pathfinder Dam and the Interstate Canal began in 1905 and was completed in 1915. The dam was constructed from granite quarried from nearby hills. It is an arch dam with a structural height of 295 feet.

Construction of the Guernsey Dam was started on June 1, 1925 and was completed in July 1927. While Guernsey Dam and Pathfinder Dam are more than 150 miles apart, the two are integrally related. Water released from Pathfinder Reservoir can be held by both Glendo and Guernsey reservoirs to meet varying irrigation requirements.

The major Wyoming features of the Minidoka Project are Jackson Lake Dam and Jackson Lake. In 1907, a temporary rockfilled crib dam was completed by the Bureau of Reclamation at Jackson Lake to store 200,000 acre-feet of water until storage requirements of the total Minidoka Project could be determined. In 1910, a portion of the dam failed, so in 1911, a concrete structure with earth embankment wings was build at the site. In 1916, additional work raised the dam 17 feet, to a structural height of 65.5 feet, and increased storage capacity to 847,000 acre-feet.

In southwestern Wyoming, the Colorado River Storage Project had a major effect with construction of the Flaming Gorge facilities in extreme northeastern Utah. The concrete structure has a maximum height of 502 feet, creating a reservoir with an active capacity of 3,515,700 acre-feet. The dam structure itself contains 987,000 cubic yards of concrete. The Flaming Gorge Dam was topped out in late 1962, and the power plant began commercial operation in 1963.

Another southwestern Wyoming project, the Seedskadee Project, includes the Fontenelle Dam. Construction of the Fontenelle Dam began in June 1961 and was completed in April 1964. Power generation began in May 1968. Originally conceived as an irrigation storage dam, the Fontenelle Dam evolved toward a structure to store water for cities and industries. Recent structural deficiencies discovered at the Fontenelle Dam have historical precedent. In 1965, after the reservoir had been filled to capacity, water passing through relief cracks in the right abutment washed away part of the downstream embankment. The water level was lowered and repairs were undertaken (completed in 1967).

The Shoshone Project near Cody includes the Buffalo Bill Dam and Reservoir. In 1899, William Cody and some business associates acquired a water right from the State of Wyoming for the purposes of irrigating about 60,000 acres of public land near Cody. As a first step, the group constructed a canal on the south bank of the Shoshone River. In 1903, the Wyoming State Board of Land Commissioners, with Cody's blessings, urged the Reclamation Service to complete the proposed irrigation project.

Construction of the Buffalo Bill Dam began in 1904, and water storage began in 1910. It is one of the first high concrete dams built in the United States, rising to a structural height of 325 feet and containing 82,900 cubic yards of concrete. The Shoshone Power Plant is located near the base of the dam.

The Pick-Sloan Missouri Basin Program includes several major Wyoming dams, including Keyhole, Boysen, and Kortes dams.

Located in northeastern Wyoming, Keyhole Reservoir stores water of the Belle Fourche River. The Keyhole Unit was authorized by the Flood Control Act of 1944. Construction began on June 29, 1950 and was completed on October 25, 1952.

The Boysen Unit impounds water of the Wind River in west-central Wyoming and provides power generation, irrigation, flood control, and recreational benefits. In 1908, a concrete dam was constructed across the Wind River and downstream from the present site of Boysen Dam. However, in 1923 raised water levels in the reservoir flooded several miles of railroad track. A portion of the dam was blasted away to forestall future flooding. Repairs to the dam were never made, and power generation ceased in the early 1930s.

In 1941, the Bureau of Reclamation undertook new studies of the area and recommended construction of the new Boysen Dam about 1.5 miles upstream from the old site. Construction began on the Boysen Dam on September 19, 1947 and was completed on December 11, 1952.

Located two miles below Seminoe Dam, Kortes Dam is among a string of dams along the North Platte River. It was also the first unit initiated by the Bureau of Reclamation under the Missouri River Basin Project. Construction of the dam began in 1946 and was completed in 1951. Because of the enormous demands for power in the area during the construction period, power-generating equipment was erected concurrently with the dam and powerhouse. Indeed, the generators were placed in service even before the powerhouse was completed.

ENERGY-RELATED CONSTRUCTION

The energy boom of the 1970s resulted in much new construction in Wyoming. Among the heavy construction projects initiated or completed during the decade were several large power plants, including the Dave Johnston, the Jim Bridger, the Wyodak, the Neil Simpson and the Laramie River Station plants.

Construction of Pacific Power & Light's Dave Johnston Plant, located six miles east of Glenrock, actually commenced during the 1950s. However, the last of the plant's four units was not completed until 1972. Each of the four generating units has a separate boiler, which range in height from 170 feet to 210 feet. The uprated generation capacity of the plant is 810,000 kilowatts. At the time of its construction, the Dave Johnston Plant was the largest facility of its kind in the Rocky Mountain region.

PP&L's massive Jim Bridger Plant, located 35 miles northeast of Rock Springs, has a four-unit generating capacity of 2 million kilowatts per hour. Initial construction began during the summer of 1970, and the first unit was completed in late 1974. The peak construction phase was reached during 1976-1977, when approximately 3,000 workers were employed. As of December 31, 1983, the gross investment in the plant amounted to over $572 million. The final unit was completed in December 1979.

PP&L's Wyodak facility is a 330,000 kilowatt plant located on the eastern flank of the Powder River Basin about five miles east of Gillette. Construction on the plant began in May 1974. As partners in the plant, PP&L and Black Hills Power & Light share the output of the plant. Transmission lines run from the plant to South Dakota, and then on to Stegall, Nebraska. Peak construction occurred at the plant in 1976-1977, when about 1,200 workers were employed. The plant went into commercial operation during the summer of 1978. Total cost of the project was $250 million.

The original Wyodak Plant, along with the Wyodak Coal Mine, was purchased by Black Hills Power & Light in 1953 from the Homestake Mining Company. The original plant consisted of four small units and were officially retired in 1981. Unit 5, the only operating unit at the renamed Neil Simpson Station, was constructed between 1967 and 1969. The Osage Plant, a second power plant operated by BHP&L in northeastern Wyoming, was constructed between 1967 and 1969.

Peak construction at the Missouri Basin Power Project's Laramie River Station near Wheatland occurred during 1979-1980 at about 2,500 workers. The plant consists of three 500-megawatt generating units. The first unit went into commercial operation in July 1981, and the last unit went into operation in November 1982. The project is jointly owned by six agencies which supply power for more than 180 rural electric cooperatives and municipally owned electric systems in eight states of the West and Midwest.

MILITARY CONSTRUCTION

Construction of missile sites in Wyoming is once again prominent in the news, as it periodically has been during the past 30 years. In 1956, F.E. Warren Air Force Base was designated to receive the Atlas Intercontinental Ballistic Missile (ICBM), and the base became part of the Strategic Air Command branch of the U.S. Air Force. Atlas missiles were received by the 389th Strategic Missile Wing.

The wing's first squadron, the 564th Strategic Missile Squadron, was the nation's first operational tactical ICBM squadron. The 564th Atlas missile complex at Warren was the first and only one of its type constructed. Designated 564-A and 564-B, it was located 21 miles northwest of Cheyenne and consisted of two launch control centers, and six missile launch and service buildings.

The 565th Strategic Missile Squadron consisted of three complexes. Each complex had one launch control center, and three launch and service buildings. The third squadron, the 566th, consisted of nine missile complexes. With the addition of the third squadron, the 389th Wing was the largest Atlas missile wing in the U.S., both in areal extent and numbers of missiles.

On July 1, 1963, the 90th Missile Wing was activated at Warren and the Atlas system was phased out. The Atlas system was replaced by the Minuteman I system. By June 1965, the wing

was fully operational and consisted of 200 Minuteman missiles and silos spread throughout Wyoming, northeastern Colorado, and western Nebraska. Beginning in 1973, the Minuteman I was replaced by the new Minuteman III/Command Data Buffer system.

The newest addition is the MX, or Peacekeeper, missile. The original plan called for 100 missiles to be deployed in existing Minuteman silos, although the number that actually will be deployed is in doubt. The location for the missiles is the 90th Strategic Missile Wing, the 400th and 319th squadrons, at Warren.

In July 1984, efforts began to build and remodel facilities on Warren necessary for MX deployment. In January 1986, the first Minuteman missiles are scheduled to be removed from their silos so silo modifications can begin. The first 10 MX missiles are expected to be operational by December 1986.

S.T. Mast, IPR

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Industry Interview

Wyoming Construction ..An Invisible Giant?

(The following is excerpted from an interview with Ron Cooper, executive manager of the Wyoming chapter of the National Electrical Contractors Association. The interview, which was conducted in April, highlights some of the challenges faced by the state's construction industry. Minor editing is included for the sake of clarity.)

WQU: What are your responsibilities as executive manager?

Cooper: I get into lots of different areas. I represent management at the bargaining table. We also train electricians through an apprentice program. In fact, Wyoming had the first state apprentice program for electricians, started in 1967. In addition, I run educational programs for contractors--studying overhead structure, sales training, estimating training, supervising training. We do a lot of research and statistics. Then we lobby at the state, local, and national levels on items concerning the electrical contracting business.

WQU: Let's talk about the construction sector in Wyoming. How can it be characterized?

Cooper: Construction is one of the largest industries in the state. I think there are pretty close to 20,000 people involved at any one time. Even with a recession, construction is 8 percent or 9 percent of the employed population of the state. There is no single employer that has a great impact, even on a national level. The largest contractor in the entire country might do only 1 percent or 2 percent of the total business.

WQU: How many contractors are there in Wyoming?

Cooper: We know there are about 225 employing electrical contractors. There are about 550 who are licensed by the state to do business. This higher number includes one-man shops and out-of-state contractors who are licensed but not working here, as well as retired or unemployed persons who still carry their licenses as electrical contractors. But for employing units--those paying unemployment compensation--there are about 225.

Electrical work is usually about 10 percent of the total construction job. So that would tell me there are about 2,000 building contractors in round figures. It's a major industry, but because each piece is so small compared to the total, it's an unknown industry.

WQU: How many different labor crafts are represented in the industry?

Cooper: I believe there are up to 18 different crafts. This includes electricians, carpenters, plumbers, sheet-metal workers, laborers, tile setters, dry-wall finishers, painters, plasterers, and roofers, operating engineers, bricklayers and masons, ironworkers, insulators, and boiler makers.

WQU: How many people are employed in those kinds of trades in the state?

Cooper: I'm just guessing here. Out of about 20,000 total employed in construction, I would say 15,000 are in building construction and another 5,000 are in heavy highway construction. That includes people like operating engineers, who run the heavy equipment.

WQU: What kind of payroll are you talking about?

Cooper: I believe we are talking about a $300 million payroll in this state. We know that electrical workers are about 10 percent of the total, and we know from the quarterly reports put out by the Employment Security Commission that even now there is between $30 million and $32 million worth of electrical payroll. In building construction, we are talking about $300 million to $320 million, if electrical is 10 percent of the total payroll. To this, we add the heavy highway. And we aren't even talking about maintenance work that is done in plants and appears on the plant's payroll.

WQU: So conceivably, it may be $300 million or better.

Cooper: Yes. Building construction alone translates into that volume. We know in specialty contracting, the payroll is 30 percent to 35 percent of the total price. So we are talking about this as a $1-billion industry even now during what is termed a recessionary economic period in Wyoming.

WQU: Would that $1 billion include all the secondary activities associated with construction?

Cooper: Yes. Again, looking at building construction, you have $320 million or $350 million worth of craft payroll. According to

our figures, there is a similar amount spent on materials and another third spent on direct job expenses--overhead and profit. Profit in the electrical business averages 2 percent after taxes. It takes an estimator to get the job. Once you get the payroll, you need a bookkeeper (these people are overhead payroll). The supply house employee doesn't show up statistically anywhere, but he is part of the support personnel required to keep a man busy on the job. When something gets built, lots of things happen to the economy. We are talking about a tremendous number of people employed, and a lot of dollars being added to the economy due to the construction industry.

WQU: When people think of the "big three" in the Wyoming economy, its the minerals sector, tourism, and agriculture...

Cooper: Construction is bigger than tourism or agriculture.

WQU: If so, you're practically invisible. Why?

Cooper: The pieces have never been put together. This is the first time the pieces have been put together in a report. Some groups don't even have an organization. The sheet-metal contractors and mechanical contractors have a national organization, but they don't have a local chapter, for example. Additionally, contractors do not advertise in public media. They might have some company brochures, but these emphasize their technical competence and are only given out to customers.

WQU: What are the consequences of your low visibility?

Cooper: First, we get no exposure in the public media, out of sight is out of mind. I think it hurts us terribly at the state level in lobbying. The legislators have a rough time passing bills concerning construction because often they don't understand it. Then, I think the people in this business need to have a little more pride in themselves. It's a very insecure industry, usually based on low bid. A long-term building project would be a two-year job. We're always depending on the next job to come along. A lot of jobs are for two weeks to a month. Many times, the union sends out a man only for a week. Better visibility would get the industry together a little and we could better address such needs as training, building codes, intra-industry relations, needs of the construction owners, the architects and engineers, plans and specifications, scheduling, and productivity.

WQU: That brings us to another point. One basic criticism of construction is that the booms and busts often spawned by major projects can cause considerable problems...

Cooper: It can cause tremendous dislocation. Look at the Jim Bridger Plant back in the 1970s. First, there was a manpower shortage. Then people come in from all 50 states. Then you have to deal with schools, courts, police facilities, shopping, and so forth. So you build up to a crescendo of completion. Then the project ends and the people are unemployed. It's that way all over the United States.

But let's look at what happens. Look at the city of Casper, an area of 43,000 people in 1970, and now we are an area over 50,000. We are not growing, but we are still maintaining the population of 50,000, which is a higher level of activity than we had in 1970. In 1974, we were talking about a boom. Now we are talking about a bust, but the general economic level is still higher than it was before. By nature, construction work is itinerant and subject to the whims of economic expansion. "Journeyman" means you journey from job to job, and from state to state. For contractors, it is difficult to maintain continuity necessary to serve a community when costs and overhead requirements fluctuate so much.

WQU: How much a part has unionism played in the construction industry?

Cooper: It's been a very important part. It has declined in the last few years. The boom years hurt unionism in that so many out-of-staters from the South came in who traditionally have not been members of unions. Many companies have been very specific about jobs being non-union because they didn't want to take the chance of having strikes. I know in 1974 probably 85 percent of the electrical work in the state was done by union craftsmen. Now it's down to probably 20 percent to 25 percent.

WQU: Do you think that is indicative of other crafts?

Cooper: Probably. I believe the electrical craft is still the most unionized craft.

WQU: What accounts for the decline?

Cooper: The unions overplayed their hands during the good times. They extracted wage increases that were too much and were unable to adjust. The unions try to maintain some standards, say for example, that a journeyman should have four years of experience. You must have a state license and various other minimum levels of skill. In order to get skilled people trained, a union contractor had to comply with regulations. Non-union contractors didn't have to comply with anything other than federal and state employment standards and wages. There are some very successful non-union contractors in the state who do a good job of training, but with no rules, no regulations, no standards so to speak. It was easier to hire non-union than it was to hire union. Why does any business lose to its competitors? It would be a mistake to count the unions out. Their training capabilities, performed by joint labor and management programs, can turn out large numbers of skilled craftsmen.

WQU: What kind of wages are paid? Is there much difference between union and non-union jobs?

Cooper: Yes, I think so. The big difference are the fringe benefits. Open shops traditionally do not have large fringe packages.

The union shop does. In a union shop, the employer pays the health and welfare package from the day the man goes to work. In the non-union, workmen traditionally do not get health and welfare benefits until they have been on the job 30 or 60 or 90 days. I don't believe there is any standard pension plan among the non-union shops, where there is in the union shops. I guess a lot of the non-union workmen are depending on social security for retirement.

Possibly the largest difference for non-union wage costs is due to the use of unskilled workers who are neither apprentices or journeymen. Total cost for the crew is the important thing on the bid. However, the building owner should consider long-term costs of maintaining the structure. High-quality construction could cost less in the long term.

WQU: What do you see in the way of near-term activity for the industry?

Cooper: I think in 1985 we are going to see another manpower shortage. First, the area around Gillette seems to be coming up very busy, and the southwest part of the state is going to be busy, due to the large Exxon (gas processing) plant. A shortage could result from several factors. Many people after the last boom had to leave the state, or they have gone into another trade or into business for themselves. Once in business, it is pretty hard to shut down and go back as a craftsman again. Also, I believe we will see wages bid back up again because of this shortage.

WQU: What about the MX missile project...?

Cooper: I think it obviously will have some impact as well. Electrically, I can't brag about it too much because we haven't had any local contracts to do work. Traditionally, large military work happens something like this: Say there are 30 jobs to bid in the spring. Traditionally, the first 10--especially in a hungry area like Cheyenne--somebody bombs the living daylights out of them. For the second 10, people get out of their panic, and they bid at least a break-even point. The last 10 are usually bid at a profit. Out-of-state contractors are going to buy their supplies outside the state. Supervisors get brought in as well. Only locally hired contractors and labor are going to put dollars back into the local economy. The really important thing is to see where the bulk of the subcontracts are coming from. I'll give you a statistic: 60 percent to 80 percent of the construction contract goes to subcontractors. So that is where you want to look. If they don't hire Wyoming subcontractors, you could be exporting 60 percent to 80 percent of the money.

I hope total dollarwise in the state, we are going up. At least I think we will see our available manpower used, even it its all on one large job. Hopefully, the offshoot will be other activities that get local contractors involved. Usually when a big job like the Exxon project gets going, even if it's done with a large, turn-key contractor, sooner or later it gets out of control, and they start to hire local contractors to help with various aspects of the work. Then if the local contractors don't get in on the job site itself, at least they get in on the new shopping center or new hospital that goes along with the population influx. Hopefully, it will happen again. By the end of the year, a skilled craftsman looking for a job in Wyoming should be able to find one.

S.T. Mast, IPR

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'Mini-boom' Prompts Reflections of Things Present, Things Past

A maxi-bloom is on a mini-boom in southwestern Wyoming this construction season. And while the current upsurge in major construction activity likely will not be accompanied by the sustained growth, and often sustained agonies, that was experienced during the boom years of the 1970s, it nevertheless gives local officials new cause for reflection about the merits and difficulties associated with such projects.

Several major projects are underway in the area. In Sweetwater County, Chevron is completing work on its $250-million fertilizer plant southeast of Rock Springs. The plant will produce a granular fertilizer product and a refined phosphate for shipment elsewhere. As a by-product, the plant will generate electricity for self-use. In addition, scrubber retrofitting at the Jim Bridger Plant west of Rock Springs will continue. Several smaller projects, including new construction at Western Wyoming Community College and on area highways, also are in process.

By far the largest project, however, is Exxon's $2.2-billion LaBarge Project, which has affected a three-county area of southwestern Wyoming. Phase I of the project includes three gas-processing modules at the Shute Creek site in Lincoln County. Phase II will include three additional modules in Sweetwater County, located approximately 1½ miles east of the Phase I modules. Gas for the plants will be delivered via a pipeline from the Riley Ridge gas field in Sublette County. With the addition of Phase II, and the subsequent approval of Phase II by the State Office of Industrial Siting Administration, total LaBarge Project employment is expected to peak at 5,251 during the third quarter of this year.

The sharp employment peak expected this summer will result from combined Phase I, Phase II, wellfield, and special construction activities. Combined employment then is expected to dip, before rising again during the 1986 construction season as work on Phase II reaches its employment high point. However, total combined employment will be substantially less than that expected during the third quarter of this year, peaking at 3,222 workers. Seasonal employment peaks also are expected during the 1987 and 1988 construction seasons, but at ever-reduced levels.

Near-term employment gains in the affected counties are expected to be substantial. Average annual construction employment in Sweetwater County is expected to rise from 779 in 1984 to 2,434 in 1985. Such employment then is expected to decline to 1,796 in 1986 and 629 by 1988.

As Rock Springs city officials are well aware, large construction projects can be mixed blessings. During the construction boom period of the 1970s, Rock Springs gained not only a payroll and a tax base, but a rather notorious reputation from boomtown evils as well.

Several factors contributed to the boom of the 1970s. One was construction of the massive Jim Bridger Plant northeast of Rock Springs. Another was the rise of the trona industry. Yet another was an upsurge in oil and gas development in the county.

During the boom of the 1970s, said Brian Rick, assistant to the mayor of Rock Springs, the city was ill-equipped to deal with the crush of impact problems that beset it. "Rock Springs technically hasn't been a boom-bust community over the years," said Rick, "even though it is strongly identified as such now. It has been a coal-mining town that frankly was on a rather steady decline since World War II. What we had was essentially a sleepy, small community that remained somewhat static for years and years--a little company town sort of set in its ways."

The boom changed all that. It also pointed out deficiencies in the municipal status quo. "I think it is fair to say we did not have a professional-style police department," said Rick. "Those types of services were adequate for the needs of the community, and what the community desired, but this community was not at all geared up to accept the housing boom in terms of planning or zoning type provisions. It definitely wasn't geared up for public safety. It was a very small police department horribly underpaid, virtually untrained. Then the boom came, and they tried to boost wages, tried to do

things rapidly without anyone in city hall really having the experience or knowledge necessary to manage and guide that type of thing, or the time to learn. We were probably lucky to survive the last boom."

Some of the negative aspects of the boom, said Rick, were clearly visible: People living in caves, makeshift worker camps in the desert, prostitutes flagging down cars, heavy burdens on community resources, and all the rest.

Other negatives of such growth, said Rick, are more subtle. People tend to become shortsighted. They gear up in anticipation of future financial bonanzas, bonanzas that are speculative at best. And not just cities, but the private sector as well. Everyone wants a slice of the pie.

"They overbuild," said Rick. "They build huge apartment complexes to house laborers. They build subdivisions because some people have home equity programs with the company they work for. They do expensive, long-term-financed improvements and expansions to existing businesses to accommodate the influx. Then when the construction force leaves, you have a lot of vacant buildings. You have apartment houses with 70 percent vacancy rates. That, I think, is a negative impact that you have to think through very carefully and plan for."

Nor do the evils of boom growth exist in a vacuum, not in the hell-for-leather days of the early railroad camps, and not today. "If you are willing to tolerate the situation, it probably exists," said Rick. "If you identify it as something unacceptable, a lot of times if people don't feel welcome, they tend to leave. Some need more encouragement than others, but community attitudes play a big part in it."

In Rock Springs, many things have changed since the boom of the 1970s. Planning for the current "mini-boom" has been exhaustive. New housing developments are being discouraged to meet short-term demand since it appears existing housing should be adequate through the peak third quarter period. Temporary worker camps in or near the community are strictly regulated. Police services are both adequate for projected demand and, according to Rick, professional in caliber. Moreover, said Rick, community attitudes also have changed.

During the Bridger era, said Rick, "it was wide open and everyone was out to make a buck. There was an attitude that this was just a place to park until the next job came along or until the coal mines opened again." Today, said Rick, things are different. Rick felt the community has taken new pride in itself.

To illustrate his point, Rick cited the local cemetery. "When I moved here two years ago, the new cemetery was about half done. The unfinished half was awesome to see. It was the old, typical boothill that you saw in old westerns--no grass, no sprinkler systems, tumbleweeds, dust, dirt. Everyone took care of their own little plot, so it was just a mess. If you were to drive through today, you would see a very modern cemetery." Such positive signs of renewed community pride, said Rick, probably mean the city would "not tolerate the situations that used to exist."

Despite the darker aspects of boom development visited upon Rock Springs during the 1970s, Rick says the benefits of such projects are substantial. New cash in the economy means increased retail sales. In the long term, such plants provide a solid tax base and steady employment. The Shute Creek Plant, for instance, is expected to have a permanent work force of about 500 workers.

Housing shortages can rapidly develop when an influx of workers arrives with major construction projects. However, coming into the construction season, Sweetwater County Planner Steve Watson said the county had a substantial rental vacancy rate, due in part to layoffs in the trona industry. In addition, two "man camps," one at the Shute Creek site and the other at Big Piney, have been constructed to relieve housing pressure during the peak employment period.

Watson said the biggest impacts probably will be in the area of social services, especially law enforcement and town administration.

Like Rick, Watson felt such large construction projects are of lasting benefit to a community: "The advantages outweigh the disadvantages in the long run," said Watson. "You get new people, which I always think is healthy. You increase the tax base. Sometimes, you put up with pretty major inconveniences. During the Bridger days, you certainly did. I think people have learned how to deal with it a lot better since that time. Especially in a project like this. It is going to be a very short-term impact."

Which is not to say that no problems familiar during the boom of the '70s will be present during the current construction. Coming into the construction season, Sweetwater County Court Judge Bradford Schroeder said he had seen an increase in cases which he related directly to the LaBarge Project, particularly the number of cases involving controlled substances. Of the recent drug cases he had heard, Schroeder said perhaps 50 percent had involved LaBarge project workers. In addition, Schroeder felt the number of cases was higher than would be suggested by population increases alone. "My belief is that it has to do with, if you will, the type of person who is being drawn to the types of jobs available out there (the LaBarge Project). Generally, we are looking at relatively young age group. They are greatly transient in nature. They have no roots in this community. A good many are young, single males with no family, that we often look at as perhaps making a person more stable or less apt to become involved in criminal violations."

To meet the increases, Schroeder said the county had taken steps to beef up its law enforcement activities. In addition, Schroeder said, it appeared Exxon and Project Construction Corporation, the primary construction contractor at the Shute Creek site, had taken a hardline attitude toward drug use.

In Lincoln County, according to the Industrial Siting Administration's review of Exxon's Phase II permit application, average annual construction employment is expected to jump from 558 in 1984 to 1,377 in 1985, then decline to 1,037 in 1986. Average annual basic employment is expected to grow from 3,158 in 1984 to 4,193 in 1985, then to drop slowly through 1987.

The current construction activity is a less familiar scenario for Lincoln County. Lacking the historical perspective of Sweetwater County officials, planners in Lincoln County also expressed deeper concerns.

The volumes of reports, the proliferation of numbers, that are intended to gauge what the future holds are mere numbers, based on a given set of assumptions. They may or may not be maps to reality.

"Numbers," said Jim Sayre, long-range planner for Lincoln County, "All these numbers are assumptions. We are very concerned about the management aspects of this thing (the LaBarge Project). Rock Springs and Green River have had booms before. Kemmerer has had booms before, too, but we're not as experienced as Rock Springs. There are just too many variables."

One variable Sayre and Planning Director Rusty Bonser saw as both critical and cloudy for the long-term future of the project were the markets for the vast quantities of products to be produced by the Shute Creek Plant. According to the permit application review, plant products will include gas, carbon dioxide, helium, and sulphur. The carbon dioxide is intended for tertiary oil recovery projects in Wyoming, Colorado, and the Williston Basin of North Dakota. Without markets, the planners said, the project could end up in mothballs, like the Colony Oil Shale Project on Colorado's Western Slope.

"There is a philosophy there of two different things," said Bonser. "If you are a poor county and you don't have a lot of industry, or you are Sweetwater County and have had a lot of industry, anything that will help is okay. You gamble along with them. My problem is if it does put the county we work for in a bad spot, the towns in a bad spot, they are not going to come back and say 'sorry.' We are dealing with peoples' lives here, too. We are not just dealing with dollars and cents."

The markets for mineral products can be highly volatile, as recent history has demonstrated. "Some young guy in New York in a

three-piece suit and a personal computer on his desk making physical calculations, he pushes the return button and some calculation turns up negative someplace, that thing will be cancelled just as fast as Colony was," added Sayre. "We can make reasonable assumptions. It is assumption after assumption. You can crank all the numbers you want, but they are based on assumptions that we need to monitor and manage."

Coming into the construction season, Kemmerer City Administrator Dave Johnson felt Exxon had put forth its best effort in identifying possible impacts associated with the LaBarge Project, but he also felt the system for monitoring such impacts was inadequate. Such a system, according to Johnson, should allow impacted communities to accurately gauge how much actual impacts deviate from projected impacts as the project proceeds.

"We are behind time," said Johnson, "because I think it is a new animal. It was something we had always discussed in the past--let's monitor this thing. But when you start trying to put something together that is so complex--so many variables and so many assumptions have been made--it's difficult to do. I give Exxon credit for their attempt, but I think we still have to go much further in satisfying that monitoring system."

In Sublette County, according to the Industrial Siting Administration's review of Exxon's Phase II permit application, average annual construction employment is expected to grow from 170 in 1984 to 1,146 in 1985. It is then expected to decline to 948 in 1986 and 660 in 1987. Total employment, according to the document, is projected to grow by over 50 percent between 1984 and 1985, due mainly to wellfield development activities. The large demand for labor is expected to drive the unemployment rate below 3 percent during 1985.

The report cites Big Piney, Marbleton, and Pinedale as three Sublette County communities that will be affected by the LaBarge Project. By early July, Dick Holgate, mayor of Big Piney, said the project had resulted in no undue difficulties for the community: "So far it's worked out," he said. "I don't have any complaints at all."

In the matter of housing, Holgate said Big Piney still had vacancies available. In addition, the Big Piney "man camp," located near the town, was below full capacity.

Holgate said much depended upon the scheduling of the project. A sudden new influx could occur as various portions of the work are completed in the weeks ahead. "Tomorrow they might need a hundred welders," he said. "We know we are going to have influxes. But so far, it has worked out."

Pinedale is located on the periphery of the LaBarge Project, and until January, according to Town Administrator Ken McLaughlin, was not even considered in the project's area of influence. "What everyone else did in two years (in terms of preparation for the impact), we essentially had to do in two months," said McLaughlin.

By early July, McLaughlin said it was still difficult to gauge what the total impact would be on Pinedale since the peak construction work was still ahead.

McLaughlin said virtually all the housing rentals in Pinedale were occupied, although some houses were for sale. In the area of law enforcement, he said the town's six officers probably would be adequate through the peak construction phase.

In terms of economic benefits, McLaughlin said while the short-term tax benefits generated because of the project would probably be somewhat greater than the amount the town has to spend due to the increased activity, such benefits would rapidly dwindle in coming years. While the county tax picture might improve, the municipal picture would not in the long-term. Also on a long-term basis, McLaughlin said the town would gain virtually no benefits from increased employment since the community sits away from the main focus of activity.

"We have more recreational opportunities than LaBarge or Big Piney, so there might be more dollars spent here," said McLaughlin, "but the only real long-term impact I see is the possible degradation of the wilderness from acid rain (from plant emissions)."

S.T. Mast, IPR

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Platte County Officials Grateful for Power Plant's Lasting Benefits

The Gillette Syndrome, a popular notion advanced during the 1970s, attempted to link boom growth with a variety of social ills. If such a thing existed at all, Platte County may be one of its poorest examples. Indeed, during the post-boom period, Platte County community leaders are more apt to count their blessings than to curse the fates. Perhaps the most repeated question about the boom experience is simply, "Where would we have been today without it?"

"At the start of 1970," wrote Platte County Record-Times Editor Bob Krumm in 1982, "Platte County was dying. Its population was at an all-time low for the century at 6,486. Fifty-five percent of the families in the county had a gross annual income of less than $8,000. . . Serious discussion was taking place about the possibility of having to merge with Goshen County."

During the mid-1970s, however, initial work began on the Missouri Basin Power Project's Laramie River Station and the associated Grayrocks Dam. During the late 1970s, construction reached its peak with over 2,500 workers and the population swelled. According to census figures, the population grew from 6,486 in 1970 to 11,975 in 1980, an increase of 84.63 percent. It was a boom of major proportions. Yet when looking back on the experience, those community leaders interviewed saw the problems accompanying such growth as minor, compared to the lasting, residual benefits of the project.

"Probably the most surprising thing we had to adjust to were the joggers," observed State Representative Jim Geringer (R-Platte) half-facetiously. "I mean, you come from a rural background all you think of is the work that has to be done, and here's some guy or gal running up and down the road to burn off energy. I don't know if that came with the plant or a sign of the times, but we had to do some adjusting to the joggers. Used to be the only people you watched out for driving down the road was a guy with a combine over the centerline."

The newcomers to Platte County actively participated in community life. "The one thing these people did when they came was to get right involved. They didn't wait to be asked, they just volunteered," said Geringer. Since their work hours were fairly regular, the newcomers often were able to contribute more than more established community members--like those engaged in agriculture--whose hours were less certain.

"When they moved on," said Carolyn Teter, executive secretary of the Platte County Chamber of Commerce, "we lost a lot. We are now feeling that loss. I know we are feeling it in organizations like the chamber, the Lions, Jaycees, Kiwanis, and the charitable organizations. It is getting tough to get people to participate."

Platte County has experienced economic difficulties in recent years. However, local officials blamed those difficulties as much on the general recession, and on continuing hard times being experienced by agriculture, as on the wind-down of plant construction. Indeed, the new plant has provided a bulwark against even greater economic woes.

"It's hard to say what Wheatland would have been," said Geringer. "If the plant hadn't come in, it's hard to say what we would have done."

For one thing, the plant has provided a solid employment core of 380 permanent workers that otherwise would not have existed. The plant also provides a lion's share of the county tax base. In 1984, the assessed valuation of the county was $137.8 million, 72 percent of which was related to the plant facilities, according to George Bartholomew, supervisor of community development and legislation for Basin Electric.

Some difficulties in the Platte County real estate market have been in evidence recently, a portion of which probably can be attributed to speculation as a result of the plant and a concomitant downturn in the general economy, said Bartholomew. However, he added that the brunt of the housing impacts have been absorbed by the Missouri Basin Power Project itself.

The project was responsible for developing Black Mountain Village, a subdivision in Wheatland. The subdivision consisted of 284 single-family lots, of which 240 were temporarily zoned to allow two mobile homes per lot. An additional 135 single-family lots were zoned for four recreational vehicles per lot during the construction period. Today, Black Mountain Village is all but vacant. But the subdivision was consistent with the needs of the construction work force, many of whom were daily, weekly, or monthly commuters from throughout the region.

The population of Platte County has dropped since 1980 and the wind-down of construction work on the project. In 1982, the population of Platte County was 8,503, down from 11,975 in 1980. Even so, the population was still over 2,000 higher than its 1970 level.

Other benefits accrued to the community during the construction boom, including upgraded sewers, a new school, and new water facilities. Indeed, some systems were probably overbuilt. On balance, said Jim Dunham, clerk-treasurer for the town of Wheatland, the power plant project was "one of the best things that ever happened to Wheatland."

S.T. Mast, IPR

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ECONOMIC CHANGES

ECONOMIC CHANGES

(Editor's note: The purpose of this section is to point out areas in the Wyoming economy in which noteworthy changes occurred, or in which existing trends were significantly accentuated, during the latest reporting period.)

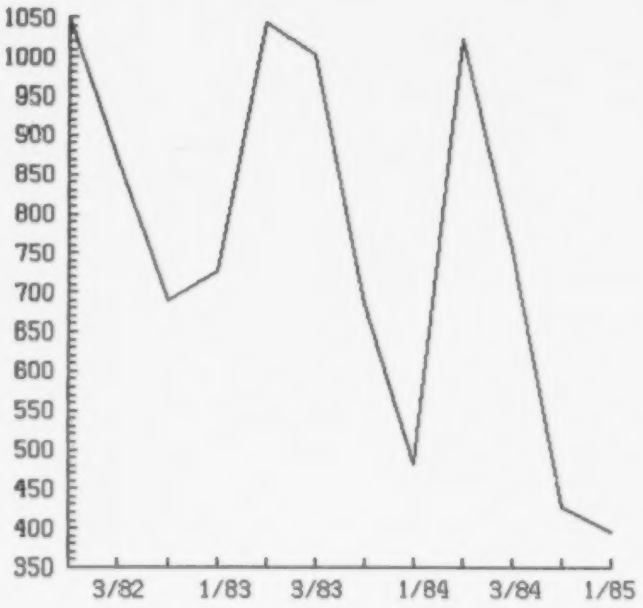
Changes in new residential dwelling units, initial unemployment claims filed, and state oil production highlight the Update's first quarter statistics.

The number of new residential dwelling units hit its lowest mark in the Update's 12-quarter reporting period. New units totaled 397 during the first quarter, down from 481 during the same period in 1984 and down from 727 during the first quarter of 1983.

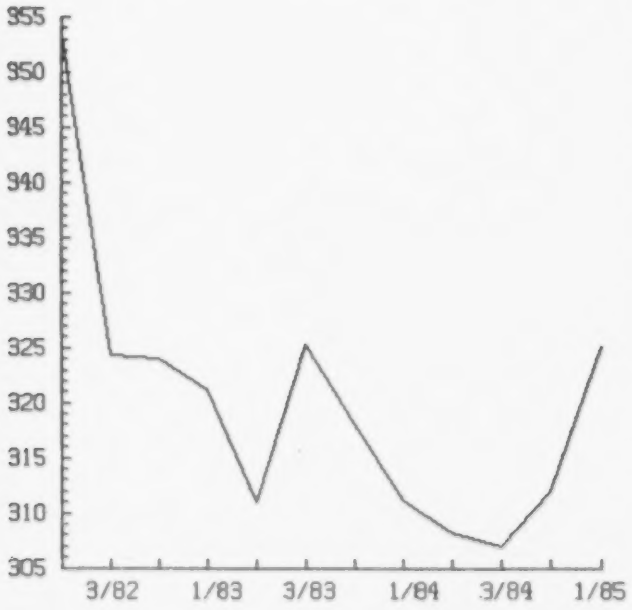
Initial unemployment claims filed rose during the period, reaching their highest levels since the first quarter of 1983. Claims filed during the first quarter totaled 13,108, compared to 8,237 during the fourth quarter of 1984 and compared to 10,502 during the first quarter of 1984.

Wyoming oil production increased significantly during the first quarter. State oil production totaled 325,000 barrels per day, its highest level since the third quarter of 1983. U.S. oil production and state coal production also showed increases over fourth quarter figures.

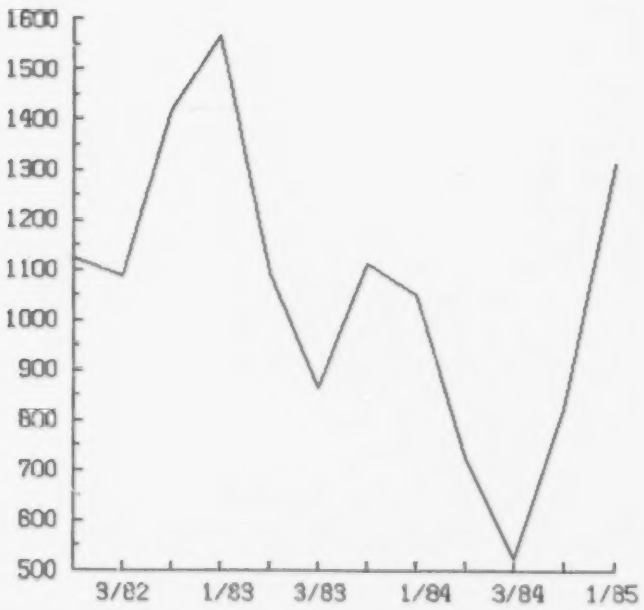
New Residential Units



Wyoming Oil Production



Initial Unemployment Claims



WYOMING DATA

Table 4: Agriculture[1]

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Timber Cut in Wyoming National Forests (MBF)	4285.	23430.	26318.	14707.	5208.	35941.	47574.	21261.	7625.	48671.	63055.	23591.
Price Indices[2] (1967=100)												
2. Wyoming Crops, Prices Received-Latest	249.	245.	244.	247.	254.	280.	280.	269.	273.	262.	258.	253.
3. Wyoming Crops, Prices Received-Average	251.	239.	243.	246.	253.	268.	279.	270.	277.	261.	260.	256.
4. U.S. Crops, Prices Received-Latest	240.	239.	220.	234.	239.	260.	262.	267.	279.	265.	240.	242.
5. U.S. Crops, Prices Received-Average	240.	235.	221.	226.	244.	255.	258.	266.	275.	271.	253.	240.
6. Wyoming, All Commodities, Prices Received-Latest	256.	250.	225.	261.	246.	239.	244.	252.	246.	255.	251.	265.
7. Wyoming, All Commodities, Prices Received-Average	261.	246.	234.	249.	253.	233.	239.	251.	256.	249.	252.	256.
8. U.S., All Commodities, Prices Received-Latest	252.	248.	232.	245.	243.	248.	256.	265.	262.	254.	245.	244.
9. U.S., All Commodities, Prices Received-Average	251.	247.	234.	240.	247.	247.	249.	264.	264.	259.	249.	246.
10. Wyoming Livestock, Prices Received-Latest	258.	251.	219.	265.	244.	227.	233.	247.	238.	253.	248.	268.
11. Wyoming Livestock, Prices Received-Average	264.	248.	231.	249.	253.	223.	228.	245.	250.	246.	250.	256.
12. U.S. Livestock, Prices Received-Latest	262.	257.	243.	256.	247.	240.	251.	264.	248.	245.	251.	247.
13. U.S. Livestock, Prices Received-Average	261.	258.	245.	253.	251.	242.	241.	264.	255.	249.	247.	251.
14. Prices Paid by U.S. Farmers-Latest	317.	316.	315.	321.	324.	326.	328.	335.	335.	333.	332.	332.
15. Prices Paid by U.S. Farmers-Average	315.	317.	315.	320.	324.	325.	327.	333.	336.	334.	332.	332.

[1]First time readers of WQU should refer to the "Format" page (in back) for an explanation of abbreviations and table formats.
[2]The index for the last month (latest) of each quarter, along with the average of the three monthly indices of each quarter.

Sources: Series 1: United States Forest Service. "Timber Cut and Sold, Convertible Products." Region 2 and 4 reports published quarterly.
Series 2-15: Wyoming Crop and Livestock Reporting Service. Bi-weekly Ag Statistics.

Table 5: Banking and Finance

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Total Bank Loans and Leases Financing Receivables (T$)[1]	*****	*****	*****	*****	*****	*****	*****	2313197.	2359492.	2368731.	2352704.	2356267.
2. Total Bank Deposits (T$)	3322621.	3345619.	3587554.	3537206.	3669552.	3683748.	3789387.	3747828.	3812354.	3790977.	4005456.	3808654.
3. Total Non Interest-Bearing Deposits (T$)[1]	*****	*****	*****	*****	*****	*****	*****	657189.	734297.	723344.	742392.	652223.
4. Savings and Loan Mortgage Loans (T$)[2]	760622.	766593.	765708.	758938.	760041.	775159.	775795.	767125.	775396.	771560.	806660.	780644.
5. Savings and Loan Deposits (T$)	907758.	893087.	895889.	921290.	960250.	966113.	1006927.	1051271.	1087036.	1111213.	1142593.	1161848.
6. Prime Interest Rate[3]	16.50	13.50	11.50	10.50	10.50	11.00	11.00	11.21	12.60	12.97	11.06	10.50

[1]During the first quarter of 1984, the Wyoming State Bank Examiner began publishing it's quarterly report ("The Abstract Report of State and National Banks in Wyoming") in a slightly different format. IPR will therefore be altering the following banking and finance data series: total bank loans and total demand deposits. Beginning in the first quarter of 1984, data for total bank loans will include lease financing receivables; data for total bank demand deposits will be replaced by figures for noninterest-bearing deposits. For comparison, the reader can refer to past issues of the WQU.

[2]Only members of the Federal Home Loan Bank Board are included.

[3]Rate is for the last month of the quarter.

Sources: Series 1-3: Wyoming State Bank Examiner Quarterly Report.
Series 4 and 5: Federal Home Loan Bank of Seattle, Monthly Report. Comparative statistical analysis of member institutions.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published Monthly.

Table 6: Business Conditions

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. New Domestic Corporations	428.	403.	377.	348.	410.	366.	309.	359.	359.	332.	273.	308.
2. New Foreign Corporations	326.	285.	272.	240.	259.	331.	292.	260.	249.	259.	244.	224.
3. Total New Corporations	754.	688.	649.	588.	669.	697.	601.	619.	608.	591.	517.	532.
4. Business Failures	46.	54.	58.	47.	68.	52.	58.	59.	64.	67.	68.	70.
5. Value of Business Failures ($)	6842595.	-13034324.[1]	-6860186.[1]	6438421.	6400333.	535473.	-8163171.[1]	17789116.	14081414.	11774068.	12763251.	-25485776.[1]
6. Personal Bankruptcies	125.	123.	122.	140.	152.	172.	141.	180.	166.	169.	183.	176.

[1]Assets exceed liabilities.

Sources: Series 1-3: Secretary of State. New and Foreign Corporations. Monthly report.
Series 4-6: Cheyenne Credit Bureau. Wyoming bankruptcy cases, business failures, and value of failures. Weekly publication.

Table 7: Construction

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. New Residential Dwelling Units	1050.	872.	689.	727.	1044.	1002.	685.	481.	1022.	755.	426.	397.
2. Value of Residential Dwellings Constructed (M$)	58.6	51.2	41.9	44.4	70.7	60.3	40.0	28.4	59.6	44.5	26.9	25.3
3. Value of Nonresidential Construction (M$)	59.8	63.1	35.2	37.9	54.4	48.2	59.9	11.5	28.6	26.9	79.0	31.7
4. Building Permits Issued in Selected Wyoming Cities	3353.	4295.	2803.	2762.	3586.	3701.	2138.	2025.	3892.	3546.	2438.	1713.
5. Value of Authorized Construction (T$)	62939.	101359.	34470.	37119.	46402.	68715.	51924.	29471.	42320.	36344.	35282.	23474.
6. Mortgage Interest Rate[1]	14.74	14.34	13.09	12.97	11.90	12.08	11.94	11.56	11.61	12.03	12.05	11.42

[1]Conventional first mortgage for new home purchase. U.S. average for last month of quarter.

Sources: Series 1-3: F.W. Dodge Division of McGraw-Hill. "Dodge Construction Potentials." Published monthly.
Series 4-5: Institute for Policy Research. "Local Construction Reports." Survey of authorized construction in selected cities conducted monthly.
Series 6: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.

Table 8: Consumers

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. New Truck Registrations	3636.	3024.	3230.	3233.	3415.	3417.	4363.	3927.	4418.	4102.	4574.	3581.
2. New Car Registrations	4042.	3506.	3610.	3272.	3539.	3671.	3483.	3083.	3741.	3676.	3397.	3012.
3. Wyoming Personal Income[1] (M$)	6231.	6217.	6123.	6069.	6061.	6128.	6265.	6273.	6374.	6560.	6540.	INA
4. US Disposable Income (B$)	2157.	2196.	2238.	2261.	2303.	2367.	2429.	2502.	2554.	2606.	2645.	2653.
5. US Personal Income[1] (M$)	2560121.	2586519.	2629632.	2651672.	2705157.	2754010.	2827017.	2906532.	2970393.	3039948.	3086435.	INA
6. Latest US Consumer[2] Price Index (1967=100)	290.1	292.8	292.0	293.0	297.2	300.8	301.5	303.3	306.2	312.1	312.2	315.3
7. Quarter's Average US CPI	286.8	292.3	292.9	292.5	296.1	299.5	301.4	303.1	305.2	310.0	312.1	313.9
8. Liquor Sales (T$)	9057.	8917.	10464.	7102.	7868.	8455.	9863.	6622.	7478.	8180.	9554.	6360.

[1]Revised series. Business Week, the previous source for monthly personal income for Wyoming and the U.S., has discontinued its series. Personal income data will subsequently be collected from the Bureau of Economic Analysis, U.S. Department of Commerce. Readers should be cautioned that the two series are not comparable.

[2]Number shown is for the last month of the quarter. CPI shown is the index for wage earners and clerical workers, not the CPI-U. Beginning with the data for January, 1985, the index is affected by a change in methodology used to compute the homeownership component.

Sources: Series 1-2: R.L. Polk and Company Motor Statistical Division. "National New Vehicle Registration Service." Published monthly.
Series 3,5: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published quarterly.
Series 4,6,7: U.S. Department of Commerce, Bureau of Economic Analysis. Survey of Current Business. Published monthly.
Series 8: Wyoming Liquor Commission. Sales data are reported to IPR.

Table 9: Employment and Labor[1]

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Civilian Labor Force	257820.	258974.	251909.	250258.	267248.	273592.	256902.	249794.	261676.	261271.	253243.	160056.[2]
2. Employment	243696.	243798.	233790.	225488.	242087.	253149.	239275.	230633.	245871.	248480.	238710.	147903.[2]
3. Unemployment	14123.	15177.	18120.	24770.	25161.	20443.	17627.	19160.	15805.	12791.	14533.	12153.[2]
4. Unemployment Rate	5.5	5.9	7.2	9.9	9.4	7.5	6.9	7.7	6.0	4.9	5.7	7.6[2]
5. Initial Claims Filed	11225.	10894.	14183.	15650.	10951.	8657.	11117.	10502.	7271.	5256.	8237.	13108.
6. Applications Received	14838.	15359.	13102.	12970.	11787.	12144.	9359.	10290.	11541.	11375.	9685.	11106.
7. New Non-Agricultural Openings	8344.	9190.	7035.	4724.	6185.	7992.	5528.	4679.	9779.	12905.	8655.	7004.
8. New Non-Agricultural Placements	7161.	8079.	5450.	4106.	6608.	10529.	6446.	5946.	9111.	10348.	8331.	6308.
9. Miners' Average Weekly Hours	41.7	39.7	38.1	39.9	39.5	41.8	41.2	42.8	43.0	43.5	43.7	28.6[2]
10. Miners' Average Weekly Pay ($)	480.37	471.92	464.35	490.14	490.96	521.24	519.71	547.39	560.15	562.46	570.24	384.39[2]
11. Miners' Average Hourly Wage ($)	11.52	11.90	12.18	12.27	12.43	12.47	12.60	12.78	13.03	12.94	13.05	13.44[2]

[1] The most recent year's data are preliminary.
[2] Represents January and February data. March data was not available at time of publication due to delays experienced by the Wyoming Employment Security Commission.
Sources: Series 1-11: Wyoming Employment Security Commission. Labor Force Trends. Published quarterly.

Table 10: Energy and Mineral Production

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Wyoming Coal (TST)	25809.	24257.	26054.	25400.	24746.	29784.	27401.	32020.	28942.	31806.	33619.	34566.
2. U.S. Coal (TST)	209771.	195253.	189307.	190260.	180439.	204117.	198085.	227129.	223657.	246163.	188116.	220595.
3. Wyoming Oil (TBPD)	354.	324.	324.	321.	311.	325.	318.	311.	308.	307.	312.	325.
4. U.S. Oil (TBPD)	8657.	8653.	8679.	8679.	8658.	8680.	8700.	8737.	8683.	8662.	8692.	8860.
5. Wyoming Natural Gas (MCFD)	1138.	1075.	1306.	1172.	1269.	1050.	1373.	1348.	1255.	1229.	1369.	INA
6. U.S. Natural Gas (MCFD)	50977.	48349.	48335.	47683.	43073.	44703.	48924.	52238.	48581.	47802.	49409.	INA

Sources: Series 1,2,5, and 6: U.S. Department of Energy. Energy Data Reports. Gas data are published monthly, and coal data are published weekly.
Series 3-4: The Oil and Gas Journal. U.S. and Wyoming Oil Production published weekly.

Table 11: Government

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Sales and Use Tax Collections (T$)	66759.	65903.	61208.	56909.	46453.	53361.	55424.	55954.	51151.	57132.	59570.	54966.
2. Violent Crime[1]	389.	411.	295.	301.	274.	409.	241.	221.	318.	350.	334.	304.
3. Nonviolent Crime[2]	5778.	6346.	5093.	4802.	4821.	5319.	4219.	3728.	4486.	4790.	4170.	4170.
4. Stolen Property (T$)	4562.	3982.	2963.	3176.	2918.	3005.	2892.	2065.	2627.	2856.	2487.	2244.
5. Stolen Property Recovery Rate	49.3	42.8	42.8	46.5	36.9	40.3	46.1	42.7	42.9	51.5	45.5	51.9
6. Percent of Crimes Cleared[3]	21.0	20.1	21.3	22.8	21.8	24.2	23.5	30.9	22.4	22.9	30.7	28.3

[1]Murder, negligent homicide, forcible rape, robbery, aggravated assault.
[2]Burglary, larceny, auto theft.
[3]Clearance of a crime indicates resolution of a complaint by arrest or other extraordinary means.

Sources: Series 1: Wyoming Department of Revenue and Taxation, Sales and Use Tax Division. "Net Collections by Business Class by County." Published monthly.
Series 2-6: Uniform Crime Reporting Center for Criminal Justice Research, Division of Criminal Identification, Office of the State Attorney General. "Crime in Wyoming." Published quarterly.

Table 12: Tourism

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
Visitors, National Parks and Monuments												
1. Yellowstone	600071.	1614242.	116082.	65368.	553986.	1653211.	133088.	63927.	536765.	1561475.	100802.	66776.
2. Grand Teton	820236.	2066704.	371007.	183675.	686326.	1462761.	238442.	136459.	522640.	1373523.	206891.	130583.
3. Devil's Tower	86305.	161989.	13232.	8912.	87506.	160953.	16894.	9037.	72461.	131447.	15145.	8841.
4. Fossil Butte	6691.	10303.	1601.	626.	5134.	9120.	4206.	246.	4246.	9107.	1762.	115.
5. Fort Laramie	31447.	51881.	6906.	4887.	28311.	56592.	7665.	2352.	27529.	54704.	5527.	2625.
6. Big Horn NRA-South[1]	42059.	53839.	30720.	13428.	44977.	56419.	29358.	18715.	45104.	67403.	26388.	31533.
Other Tourism Indicators												
7. Traffic Count (Avg. # of Vehicles/Day)	126037.	166170.	97892.	84187.	122665.	167385.	97696.	85780.	125371.	169579.	101625.	88135.
8. Hotel, Motel, and Camp Sales Tax (T$)	1273.	2226.	1323.	912.	1048.	2017.	1397.	979.	1084.	2178.	1389.	932.
9. Gasoline Sales (TGL)	93556.	108733.	81347.	71330.	81160.	107116.	79911.	63980.	85891.	102748.	77108.	66736.

[1]Big Horn Canyon N.R.A. is only partially in Wyoming. Only visitation for the Wyoming part is shown.

Sources: Series 1-6: Monthly visitor use reports of the National Park Service.
Series 7: Traffic Survey Unit - Planning Branch, Wyoming State Highway Department. "Selected Recording Stations Traffic Counter Data." Published monthly.
Series 8: Wyoming Department of Revenue and Taxation monthly report.
Series 9: Petroleum Association of Wyoming. Monthly Gasoline Gallonage Report.

Table 13: Utilities[1]

Calendar Quarters	2/82	3/82	4/82	1/83	2/83	3/83	4/83	1/84	2/84	3/84	4/84	1/85
1. Residential Electric Connections	174126.	177081.	177968.	179111.	179717.	178762.	178535.	179967.	179536.	178837.	179123.	179451.
2. Residential Electric Consumption (TKWH)	375401.	302786.	391608.	489892.	392223.	294755.	395182.	562483.	437086.	359496.	484523.	542962.
3. Commercial Electric Connections	31086.	30841.	30388.	30772.	31194.	30533.	31404.	32340.	32462.	32874.	32738.	33058.
4. Commercial Electric Consumption (TKWH)	319879.	331351.	327961.	351633.	327565.	353743.	342219.	485953.	437983.	455181.	468378.	504376.
5. Industrial Electric Connections	3451.	3702.	3751.	3647.	3667.	3655.	3624.	3119.	3150.	3122.	3059.	2957.
6. Industrial Electric Consumption (TKWH)	1179112.	1178792.	1225845.	1471528.	1388817.	1397176.	1016334.	1456749.	1911229.	2049121.	2479998.	1572877.
7. Other Connections[2]	4778.	3243.	2857.	2819.	3059.	3164.	2791.	2759.	3155.	3438.	3165.	2916.
8. Other Consumption (TKWH)	31570.	70139.	12240.	6780.	8710.	46427.	13306.	6129.	13775.	50031.	10385.	5321.
9. Residential Natural Gas Connections	75413.	74861.	75955.	76567.	76449.	74638.	75037.	76263.	75081.	74802.	75736.	76112.
10. Residential Natural Gas Consumption (TCF)	2504865.	872772.	2972244.	6531664.	8926691.	2871311.	8444801.	15230399.	8356402.	2804867.	9293855.	14912809.
11. Commercial Natural Gas Connections[3]	6552.	6452.	6476.	6873.	6869.	6710.	6817.	6881.	6817.	6770.	6859.	6882.
12. Commercial Natural Gas Consumption (TCF)[3]	1075767.	385052.	1196763.	3667569.	5716746.	1792146.	4865053.	9496853.	5231096.	1656779.	5481602.	9319095.
13. Industrial Natural Gas Connections	90.	90.	95.	97.	97.	97.	98.	94.	95.	96.	93.	91.
14. Industrial Natural Gas Consumption (TCF)	5335475.	5564715.	7918440.	7626560.	10221456.	9291988.	13201149.	13193998.	25099377.	12505089.	26405131.	9633325.
15. Other Natural Gas Connections[3]	404.	409.	409.	48.	48.	46.	45.	45.	46.	46.	46.	46.
16. Other Natural Gas Consumption (TCF)[3]	134722.	44697.	138389.	176.	322.	5323.	267.	235.	905.	5882.	336.	138.

[1] Some small utilities do not report, hence the data are slightly less than actual state totals. The data are consistent. The same utilities' reports are included in each figure.

[2] "Other" includes agriculture, municipal, and other public.

[3] Figures for the first and second quarter of 1983 reflect a change in the authority connections/consumption made by the Northern Utilities. Prior to January 1983, the company listed public authority under the category of other natural gas connections/consumption. Northern Gas now combines public authority connections/consumption with their commercial natural gas connections/consumption.

NOTE: Due to divestiture, Mountain Bell is no longer able to provide IPR with the telephones in service figure; because Mountain Bell accounts for the bulk of telephone mainline service in Wyoming, IPR has decided to discontinue the telephone data series.

Sources: Series 1-18: Reports to IPR by selected electric, natural gas, and telephone utility companies. Survey conducted monthly.

Wyoming Comparative Cost of Living Index* (April 10-12, 1985): Cheyenne = 100

City	Rank	All Items	Food	Housing	Transportation	Medical
Gillette	1	122.67	110.94	153.22	101.36	106.45
Jackson	2	121.34	107.49	148.76	101.11	108.07
Sheridan	3	110.96	106.90	123.22	100.18	100.84
Kemmerer	4	110.63	104.79	126.14	98.56	102.38
Evanston	5	110.40	100.83	124.24	105.13	102.18
Sundance	6	109.26	121.88	116.51	94.69	106.43
Pinedale	7	107.61	110.91	112.47	100.42	103.18
Casper	8	106.96	107.40	109.59	107.29	107.27
Wheatland	9	106.63	106.41	113.29	99.91	101.31
Rock Springs	10	103.78	108.25	104.78	100.34	99.44
Worland	11	103.72	112.14	104.11	96.42	106.30
Douglas	12	103.11	104.14	103.17	101.12	105.98
Buffalo	13	103.04	106.17	104.26	96.77	101.14
Laramie	14	102.77	106.54	104.62	98.75	97.11
Rawlins	15	101.55	107.93	103.70	98.44	96.30
Newcastle	16	101.35	110.53	99.55	96.27	102.98
Riverton	17	100.47	103.35	103.37	98.96	99.97
Cody	18	100.37	106.47	98.00	96.81	102.49
Cheyenne	19	100.00	100.00	100.00	100.00	100.00
Thermopolis	20	99.67	109.82	94.80	98.32	97.31
Greybull	21	99.38	107.24	94.20	101.32	101.17
Lusk	22	98.98	119.21	87.20	98.64	97.74
Torrington	23	92.17	99.36	82.05	95.82	98.44

*Apparel and Recreation Indices not shown.

Source: Wyoming Department of Administration and Fiscal Control.

Average Rents by City, First Quarter 1985*

City	Average Apartment Rent	Average Trailer Lot Rent
Cheyenne	319.26	125.00
Buffalo	310.83	105.00
Casper	311.43	140.00
Cody	322.90	117.50
Douglas	330.22	117.50
Evanston	395.05	204.00
Gillette	369.98	117.50
Greybull	271.88	76.50
Jackson	365.28	103.67
Kemmerer	380.84	126.67
Laramie	337.32	121.67
Lusk	235.71	90.00
Newcastle	289.43	87.50
Pinedale	345.00	87.50
Rawlins	289.53	122.50
Riverton	304.46	111.00
Rock Springs	342.50	159.00
Sheridan	312.50	127.50
Sundance	238.33	80.00
Thermopolis	291.36	102.38
Torrington	275.83	57.50
Wheatland	250.00	100.00
Worland	279.75	118.33

*Prepared by Research and Statistics, Department of Administration and Fiscal Control.

Format

For data available at least quarterly, the last 12 quarters are printed in WQU. In this edition, published series begin with the 2nd quarter of 1982, and end with the 1st quarter of 1985. For other data series (primarily annual), the most recent observations, up to 12, are published in WQU. Most annual data series will reappear in WQU only when updated, or about every fourth issue. Quarters are calendar quarters. For example, the 3rd quarter is composed of July, August, and September. In the table headings and narratives, a particular quarter will be indicated by notation such as 2/80 (2nd quarter, 1980), 1/80 (1st quarter, 1980), and so on.

Beside each data series name is an abbreviation in parentheses. The abbreviation indicates the units (such as dollars, tons, feet, miles, etc.) of the data. The key to the units abbreviations is below.

Throughout WQU, all data are for the state unless otherwise stated. The most recent year's data should be viewed as preliminary, due to revisions. The acronymn "INA" signifies that information is not available.

The reader should be attentive to the footnotes at the bottom of pages, particularly those accompanying a data table. The footnotes help the reader to properly interpret the data, and they also indicate when more detailed (by subject or by area) data than that which is shown is available from IPR. A list of sources follows the footnotes.

Key to Units Abbreviations

MBF - Thousand Board Feet

TKWH - Thousand Kilowatt Hours

$ - Dollars

M$ - Millions of Dollars

B$ - Billions of Dollars

T$ - Thousands of Dollars

H$ - Hundreds of Dollars

ST - Short Tons

TST - Thousands of Short Tons

MCFD - Million Cubic Feet Per Day

TBPD - Thousands of Barrels Per Day

GL - Gallons

TCF - Thousands of Cubic Feet

KWH - Kilowatt Hours

TGL - Thousands of Gallons

HBBL - Hundreds of Barrels

HMCF - Hundreds of MCF Per Day

HST - Hundreds of Short Tons

$/ST - Dollars Per Short Ton

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